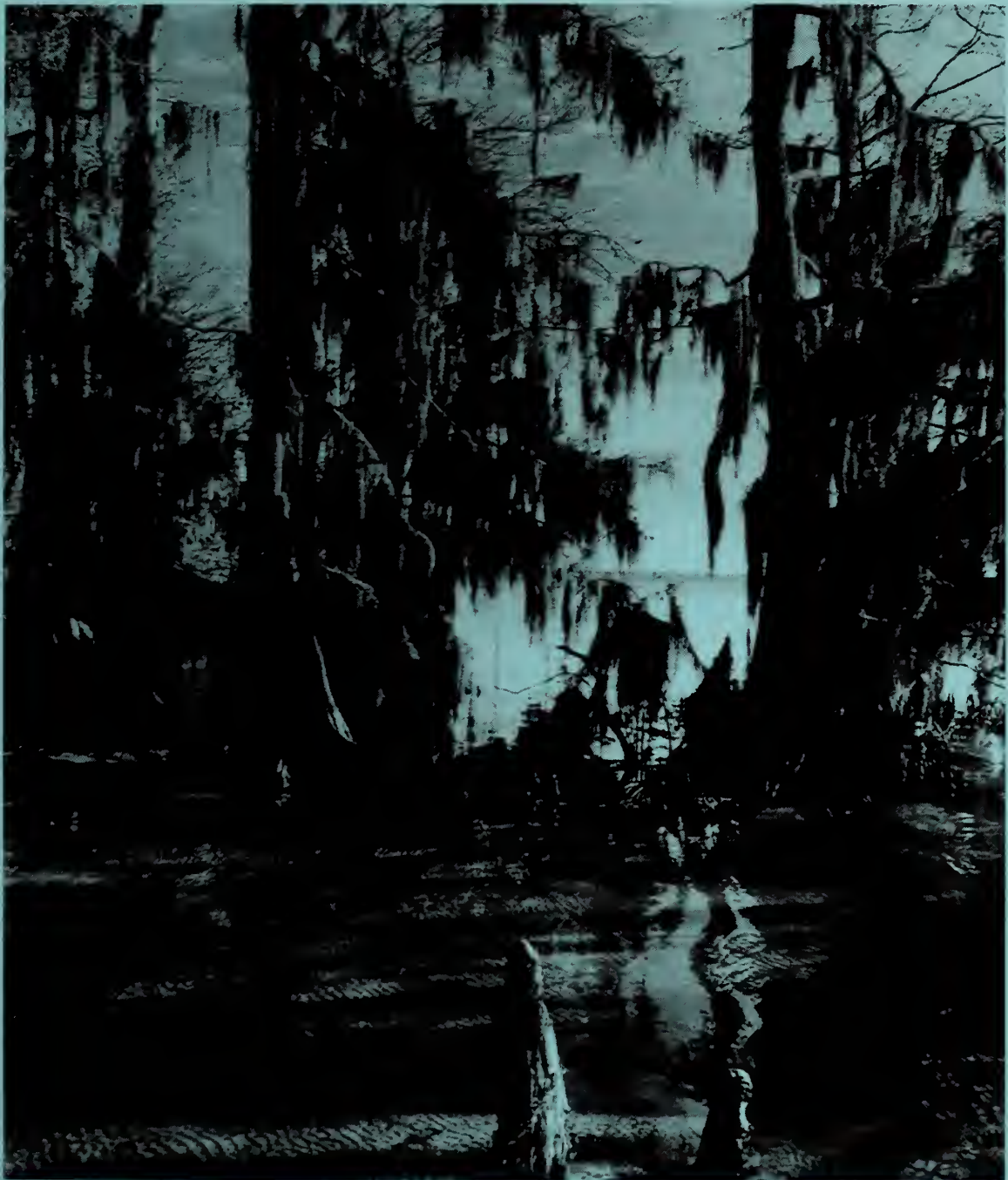


Pettigrew State Park

General Management Plan



GENERAL MANAGEMENT PLAN
FOR
PETTIGREW STATE PARK

Department of Environment, Health, and Natural Resources

Division of Parks and Recreation

Planning and Development Section

March, 1994



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INTRODUCTION

Planning is an essential element of effective and efficient park administration and management. The North Carolina General Assembly acknowledged its importance by passing state parks system legislation that includes planning requirements.

The 1987 State Parks Act (G.S.114-44.7 through 114-44.14) stipulates that a State Parks System Plan be prepared. Such a plan was completed in December 1988. It evaluated the statewide significance of parks, identified duplications and deficiencies in the system, described the resources of the system, proposed solutions to problems, described anticipated trends, and recommended means and methods to accommodate trends.

The State Parks Act also requires each park to have an individual general management plan. The general management plans are required to:

...include a statement of purpose for the park based upon its relationship to the System Plan and its classification. An analysis of the major resources and facilities on hand to achieve those purposes shall be completed along with a statement of management direction. The general management plan shall be revised as necessary to comply with the System Plan and to achieve the purpose of the [State Parks Act].

The general management plan (GMP) is to be a comprehensive five-year plan of management for a park unit. GMP's function to:

1. describe park resources and facilities;
2. state the purpose and importance of each park unit;
3. outline interpretive themes and propose locations for informational and interpretive facilities;
4. analyze park and recreation demands and trends in the park's service area;
5. summarize the primary laws guiding park operations;
6. identify internal and external threats to park natural and cultural resources, and propose appropriate responses;
7. identify and set priorities for capital improvement needs;
8. analyze visitor services and propose efficient, effective, and appropriate means of responding to visitor needs; and
9. review park operations and identify actions to support efficient and effective park administrative procedures.

The GMP for Pettigrew State Park, developed with public involvement, is intended to serve these purposes.

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I. DESCRIPTION OF PETTIGREW STATE PARK

LOCATION

Pettigrew State Park lies on a vast peninsula between the Albemarle Sound on the north and the Pamlico River on the south. The park, which includes the 16,600-acre Lake Phelps, is located on the border between Washington and Tyrrell counties.

ACCESS

Regional access to Pettigrew State Park is provided primarily by US 64, a major east-west highway. US 64 passes through the nearby towns of Roper, located about 16 miles northwest of the park, and Creswell, located approximately six miles north of the park. The Outer Banks region of North Carolina lies approximately 56 miles east.

LAND AND WATER BASE

Pettigrew State Park contains approximately 1,143 acres of land and the 16,600-acre Lake Phelps, the second largest natural fresh-water lake in North Carolina. Together they make Pettigrew the state's largest state park.

Various hypotheses exist concerning the lake's origin, including underground springs, wind and wave action, meteor showers, peat burn, and glacial activity. No one theory has gained universal acceptance. The lake sits at one of the highest elevations in the area. Its crystal-clear waters are principally recharged by natural precipitation, with possibly a small fraction coming from underground aquifers. Its source of water makes it one of the cleanest lakes in the state. It is shallow, with an average depth of 4.5 feet and a maximum depth of nine feet.

The park's land acreage includes the eight-acre Somerset Place State Historic Site, administered by the Division of Archives and History. Somerset Place was once part of a thriving plantation established for agricultural purposes around 1787. In the days when the plantation was active, a carriage path followed the shore of Lake Phelps. Today, at least a portion of, if not the entire, original carriage path is a scenic hiking trail.

Much of the park's land is located along the northern shore of Lake Phelps. A parcel of approximately 500 acres is located on the south side of the lake. Large portions of the park are wetlands and, therefore, are generally unsuitable for development of park facilities.

The vegetated shoreline of Lake Phelps consists of diverse woodlands that include several state champion trees. The lake and its adjoining wetlands are a primary wintering ground for ducks, geese, and swans. Migrating birds as well as osprey, owls, hawks, herons, and others make the park a great place for bird watching.

VISITOR FACILITIES

Lake Phelps is known for good fishing. The lake teems with large mouth bass, yellow perch, and many species of sunfish. Other game fish found in the lake include pickerel and catfish. The lake offers ideal conditions for sailing in shallow draft boats, and a variety of other pleasure craft use the lake as well. Access to the lake is available behind the park office, where two boat ramps with piers offer facilities for launching and docking boats.

Thirteen campsites, each with a picnic table and grill, are well suited for tents and trailers. Water and restrooms with showers are found nearby. A primitive tent-camping area is also provided. Its facilities include tent pads, grills, a pit privy and picnic tables. A hand pump for water is located nearby.

A picnic area is located in a large cypress grove. Tables and grills are provided. A grassy field near the picnic grounds serves as a play area. A picnic shelter is also provided.

The park's facilities are located in close proximity to the office/maintenance building and parking area. Scenic hiking trails begin in this area. One winds past the campground and Sommerset Place, passes through a hardwood forest, and ends at the Bee Tree Canal Overlook, an elevated wooden platform that offers a beautiful view of the lake. The other trail leads northwest from the office approximately three miles to Moccasin Canal. It passes through cypress and hardwood forest and has a 350-foot-long boardwalk that leads to Moccasin Overlook.

HISTORY OF THE PARK AREA

From the mysterious origin of Lake Phelps to the present day, North Carolina's largest state park has a rich and fascinating history, offering a glimpse into the relationship of human cultures and nature over the past 11,000 years.

Artifacts found in the area are evidence that Native Americans were present as early as 8,000 B.C. Thousands of relics, including pottery and spear points, have been uncovered. The most fascinating discovery is a collection of dugout canoes found sunken in the lake, one of them nearly 4,400 years old. Dugout canoes were crafted by burning the interior of cypress logs and scraping away the charred wood until only a shell remained. Native Americans who were seasonal campers in the area sank their canoes in the shallow water to store and protect them until the next hunting season.

Prior to the discovery of Lake Phelps by European settlers in 1755, the swampy area was known as the Great Eastern Dismal and the Great Alligator Dismal. The wilderness was so fearsome that explorers refused to enter it. Tradition holds that a group of hunters ventured into this "haunt of beasts" to hunt and to look for farmland. Most of the men turned back, but as the remaining few were about to leave, Benjamin Tarkington climbed a tree and saw the lake a short distance away. His companion, Josiah Phelps, ran into the water while Tarkington was still up in the tree. The first in the water, he claimed the right to name it Lake Phelps.

The area surrounding Lake Phelps was developed by Josiah Collins, who emigrated from England and settled in Edenton. Collins and his two partners in the Lake Company drained the swamp, transforming the land into productive agricultural fields and prosperous plantations. Somerset Place, named for Collins' home county of Somersetshire in England, was established about 1787. Slaves were brought from Africa to dig a six-mile canal connecting Lake Phelps with the Scuppernong River. The canal, a remarkable feat of engineering for its time, served as a transportation route and a channel for draining the swamp between the river and Lake Phelps. Later, an extensive system of canals with locks was developed to irrigate the crops of corn and rice.

The Civil War brought an end to the prosperity of Somerset Place. The Collins' were forced to sell the plantation, which then passed through several owners until it was acquired by the Federal Farm Security Administration in 1937.

Adjacent to Somerset Place is what was once the Pettigrew family farm, Bonarva. General James Johnston Pettigrew, the Confederate Civil War hero for whom the park is named, and his family left an indelible mark upon the history of the state. General Pettigrew was the grandson of the first bishop-elect of the Episcopal Diocese of North Carolina, Reverend Charles Pettigrew. His father, Ebenezer Pettigrew, was a congressman. General Pettigrew died at an early age from a wound received during General Robert E. Lee's retreat following the battle of Gettysburg. The Pettigrew family cemetery is located in the park.

The North Carolina General Assembly recognized the value of Lake Phelps as a public trust resource in 1929. Legislation passed that year declared:

...all lakes now belonging to the State, having an area of fifty acres or more, shall never be sold nor conveyed to any person, firm or corporation, but shall always be and remain the property of the State of North Carolina for the use and benefit of all the people of the State to be administered as provided for other recreational area now owned or to be acquired by the State.

(1920, c.165.)

Other than preventing the transfer of title, the legislation had no immediate effect on Lake Phelps. In fact, it was not even

immediately recognized that Lake Phelps was owned by the State. The "Third Biennial Report of the Board of Conservation and Development" mentions that under the 1929 law, "...it seems probably that... Phelps, Alligator and Pungo Lakes in the Albemarle region belong to the State and should be administered by this Department."

It was subsequently determined that Lake Phelps was indeed a state-owned lake. Because the state owned no lands around the lake, however, it "...consequently has not been able either to administer properly the lake or to take steps toward providing fuller and better public use." (Seventh Biennial Report of the Board of Conservation and Development, June 1938)

In 1937, the Federal Farm Security Administration acquired the Collins mansion and the surrounding land and incorporated it into the Scuppernon Farms Restoration Project.

On April 29, 1937, the following resolution was adopted by the Southern Albemarle Association. This association was a four-county organization consisting of Dare, Hyde, Tyrrell, and Washington Counties. There were approximately 500 people present at this meeting, with good delegation from each county. The following resolution was adopted by the Association by unanimous consent.

Whereas, the property on Lake Scuppernon, known as the Pettigrew and Collins property, has been purchased by the U.S. Government Division of Farm Security Administration, and,

Whereas, it was the home of General Johnson Pettigrew [he was born into the family home, but grew up in New Bern], one of the most distinguished of the Confederate Generals, also the site of the settlement of the famous Collins family, and

Whereas, it is the most fitting place for the establishing of a State Park,

NOW, THEREFORE, be it resolved by the Southern Albemarle Association, in conference assembled at

Plymouth, N.C., on this the 29th of April, 1937, that the body ask the Parks Division of the State Department of Conservation & Development, to take the necessary steps to obtain from the U.S. Government a certain parcel of land along the beautiful Lake Scuppernon and containing the site of both the Pettigrew and the Collins Family, upon which to establish a Park, to be known as the "Pettigrew State Park."

The County Commissioner of each of the four counties prepared and submitted a resolution to the Department of Conservation and Development in support of the above resolution. On April 8, 1939, a 99-year lease from the U.S. Department of Agriculture to the N.C. Department of Conservation and Development established Pettigrew State Park under the management of the Division of State Parks.

The Division began the update and restoration of the Collins mansion and some of the surrounding buildings in 1941. When the federal government announced its intention to abandon operation of the Scuppernong Farms Project, the Department of Conservation and Development made a formal request to the Farm Security Administration for 300 acres of land adjoining the park. This request was not granted, and on November 29, 1945, all federally owned land and buildings adjoining the park were sold at a public auction.

In December, 1947, the U.S. Department of Agriculture signed a quitclaim deed for approximately 203 acres to the state of North Carolina, permanently establishing Pettigrew State Park on what had formerly been leased land. Between 1952 and 1961, additional land was purchased for the park from the Spear and Davenport families, adding just over 66 acres to the existing park ownership.

In 1954, the overseer's house was rebuilt close to its former location near the gardens and with its original orientation toward the lake. It now serves as a ranger's residence.

On April 16, 1963, 500 acres of land on the southern shore of Lake Phelps were acquired from Lake Phelps Farms, Inc., bringing the total state ownership to approximately 17,369 acres.

In 1965, the picnic area, boat launch ramp and jetty were constructed, and in 1967 the Department of Cultural Resources, Division of Archives and History, assumed responsibility for management of the new Somerset Place State Historic Site. A program of interior restoration and furnishing of the mansion was completed in 1969 and a long-term program of restoration on the outbuildings was initiated. The Somerset Place State Historic Site includes the plantation house and related outbuildings, the remaining gardens, and a small parking area.

In late 1969, the Division of State Parks (now renamed the Division of Parks and Recreation) designed and built the existing tent and trailer campground with 13 campsites and a washhouse. Since that time, a park office and maintenance building has been added.

Eight acres were purchased from Mary Furlough in 1986, 72 from Weyhaeuser in 1987, and 43 acres from Clarion-Estates in 1990. An undetermined amount of land was donated by the Conservation Fund in 1990. The Conservation Fund had purchased the land, previously owned by First Colony Farms, Inc., in bankruptcy court. The donated land lies along the northwestern shoreline of the park. The Conservation Fund also donated substantial acreage to the U.S. Fish and Wildlife Service to form the Pocosin Lakes National Wildlife Refuge.

II. PARK PURPOSES

MISSION STATEMENT OF THE NORTH CAROLINA STATE PARKS SYSTEM

The North Carolina state parks system exists for the enjoyment, education, health, and inspiration of all our citizens and visitors. The mission of the state parks system is to conserve and protect representative examples of the natural beauty, ecological features and recreation resources of statewide significance; to provide outdoor recreation opportunities in a safe and healthy environment; and to provide environmental education opportunities that promote stewardship of the state's natural heritage.

PETTIGREW STATE PARK PURPOSE STATEMENT

The North Carolina General Assembly formally recognized the value of Lake Phelps as a public trust resource in 1929. Legislation passed that year declared that all lakes now belonging to the state greater than 50 acres in size shall never be sold but always retained for the use and benefit of all the people of the state. In 1937 the Federal Farm Security Administration acquired the Collins mansion and surrounding land for agricultural, cultural, and recreational purposes. Two years later, the federal government leased 203 acres to the state, and Pettigrew State Park was established to enable the state to improve management of the lake and provide for fuller and better public use. In 1947 the U.S. Department of Agriculture deeded the previously leased acreage to the state with the restriction that it be used exclusively for state park and public recreation purposes and for lake water-level management.

Preserving the 16,600-acre Lake Phelps is an important function of Pettigrew State Park. It is the second largest natural lake not only in North Carolina, but in the eastern United States between Florida and New York. The largest, Lake Mattamuskeet, has been heavily disturbed and manipulated, so that Lake Phelps is the largest to remain in a substantially natural condition. While various theories concerning the lake's formation exist, its origin remains unknown. The lake has a very small watershed and receives its water supply primarily from rainfall. Because the lake receives minimal runoff, its water quality is excellent. The lake plays an important role in the hydrology of the region, including groundwater recharge.

Pettigrew State Park provides important habitat for its unique and varied biological resources. Lake Phelps is a registered natural area. In contrast to the typical acidic lakes of eastern North Carolina, it contains abundant fish, including the Waccamaw killifish (Fundulus waccamensis), found only here and in Lake

Waccamaw. The vegetated shoreline of the lake contains a complex of zones, ranging from the baldcypress (Taxodium distichum) and hardwood forest in the registered natural area on the north shore, to the marshy herb fringe and pocosins on the south side. This variation is typical of a Natural Lake Shoreline Community, although the effects of human disturbance are apparent in many areas. The park's forests and pocosins are remnants of community types that were once widespread, but have now been largely replaced by agricultural uses. Aquatic plant species of particular note are the seven-angled pipewort (Eriocaulon aquaticum), leafless watermilfoil (Myriophyllum tenellum), and Northeastern bladderwort (Utricularia resupinata). The park's old-growth trees include several state champions and one national champion, redbay (Persea borbonia var. pubescens). Diverse animal life includes the black bear (Ursus americanus) and the bald eagle (Haliaeetus leucocephalus). The red wolf (Canis rufus) lives east of the park and occasionally visits.

Pettigrew State Park has outstanding prehistoric and historic archaeological resources. A significant number of large, high quality dugout canoes over 1500 years old have been found, including the second oldest discovered in the nation (4,380 years old). A unique variety of pottery has also been found. The park also offers the opportunity to study the plantation life of the 19th century. Confederate General James Johnston Pettigrew, the park's namesake, was born and buried here.

The lake offers high quality fishing and varied water recreation in an uncrowded setting. Other recreational activities at Pettigrew include hiking, nature study, camping, and picnicking. Primary interpretive themes focus upon the natural resources of the lake and surrounding forest communities, as well as Native American artifacts and culture.

Lake Phelps offers outstanding scenic vistas along its extensive undeveloped shoreline. The high canopy forest along the shore majestically rises in contrast to the flat vistas of the lake and nearby agricultural areas. The appealing clear water of the lake and large flocks of wintering waterfowl add to the park's scenic beauty.

Pettigrew exists as a state park so its valuable geologic, biologic, archaeologic, recreational, and scenic values can be protected. The Division is charged with preserving these values and providing park experiences that promote pride in and understanding of North Carolina's natural heritage.

III. SUMMARY OF INTERPRETIVE THEMES

The 1987 State Parks Act defines the purposes of the state parks system. It establishes that:

The State of North Carolina offers unique archaeologic, geologic, biologic, scenic and recreational resources. These resources are part of the heritage of the people of this State. The heritage of a people should be preserved and managed by those people for their use and for the use of their visitors and descendents.

It further provides that:

Park lands are to be used by the people of this State and their visitors in order to promote understanding of and pride in the natural heritage of this State.

One of the best methods of meeting these purposes is through environmental education. The Department of Environment, Health, and Natural Resources has adopted the following definition of environmental education:

Environmental education is a process that increases awareness, knowledge, and understanding of natural systems -- the interdependence of living things, the impact of human activities -- and results in informed decisions, responsible behavior, and constructive action.

PRIMARY INTERPRETIVE THEMES

NATIVE AMERICANS

This theme focuses on the Native American culture of northeastern North Carolina, including Native American pottery and hunting and gathering techniques. It also focuses on the artifacts discovered at the park, particularly the very old dug-out canoes and pottery.

PHELPS LAKE

This theme focuses on the uniqueness of the lake. Lake Phelps is unique because of its water quality, its size (the second largest natural lake and the largest relatively undisturbed natural lake in North Carolina), its plant and animal life (both seasonal and permanent users), and the cultural history of the lake (from Native American users up to present-day use and impacts).

OLD-GROWTH TREES

This interpretive theme focuses on the park's big trees. There are currently eight state-record trees. The theme also covers the plant communities in which the large trees are found as well as the animal habitat the trees and their communities provide. The relationship of the lake to the woodlands is also part of this theme.

SECONDARY INTERPRETIVE THEMES

Several secondary themes for Pettigrew State Park have been identified. They are:

General Pettigrew and Civil War history

Astronomy

Cultural history of the lake: the homeplace, cemetery, Somerset Place, race track, etc.

Animals: park extirpated and extinct reptiles, birds, amphibians, fish, etc.

Conservation ethic

Wildflowers

Plant communities

Park history and park system history and philosophy

Lake succession

Pocosin

IV. DEMAND

ANNUAL VISITATION TRENDS

Visitation at Pettigrew State Park has increased from 50,974 annual visits 16 years ago to 82,275 visits in 1992 (Figure IV-1). While annual visitation growth has been somewhat irregular, it has averaged growth at an annual compounded rate of 3 percent.

During 1985, a significant amount of water was pumped from Lake Phelps for fire-fighting purposes. Several years of lower-than-average rainfall followed, and the resulting lower lake water level negatively affected visitation through 1988. Once the lake water level returned to normal, attendance recovered as well. Lower water levels due to fire fighting and dry weather in 1980 also resulted in decreased visitation.

Visitation is recorded by a traffic counter placed at the gate to the park office. Since 1983, vehicle counts have been multiplied by a visitors-per-car figure of three. Prior to 1983, a visitors-per-car figure of four was used. Pettigrew also receives walk-in visitors from the adjacent Somerset State Historic Site as well as other walk-in traffic and cars towing trailers. Boats are also launched from the south side. The visitation figures are therefore not precise, but they are reasonable estimates and are useful in showing park visitation trends.

Annual visitation growth is not expected to change significantly during the next five years. If the historical 3 percent annual growth rate continues, annual attendance in 2000 will have increased to 103,597. Development of additional park facilities, such as a visitors' center and an expanded campground, would cause visitation to increase at a much faster pace. Development of the West End Access will also cause attendance to increase more rapidly.

MONTHLY VISITATION TRENDS

Pettigrew State Park receives its heaviest use from April through September. Approximately 70 percent of the park's visitation takes place during this six-month period. Average monthly visitation increases each month through May and then decreases monthly through the end of the year (Figure IV-2). This monthly attendance pattern results from increased desirability of the lake for fishing and water sports during warmer weather. Visitation in September is boosted by the popular Indian Heritage Week.

The monthly visitation figures suggest that part-time personnel should be used in the busier April-through-September period. Permanent staff also need to be available to serve visitors during this period. Where possible, work scheduling should be undertaken with this in mind.

PETTIGREW STATE PARK VISITATION 1977-1992

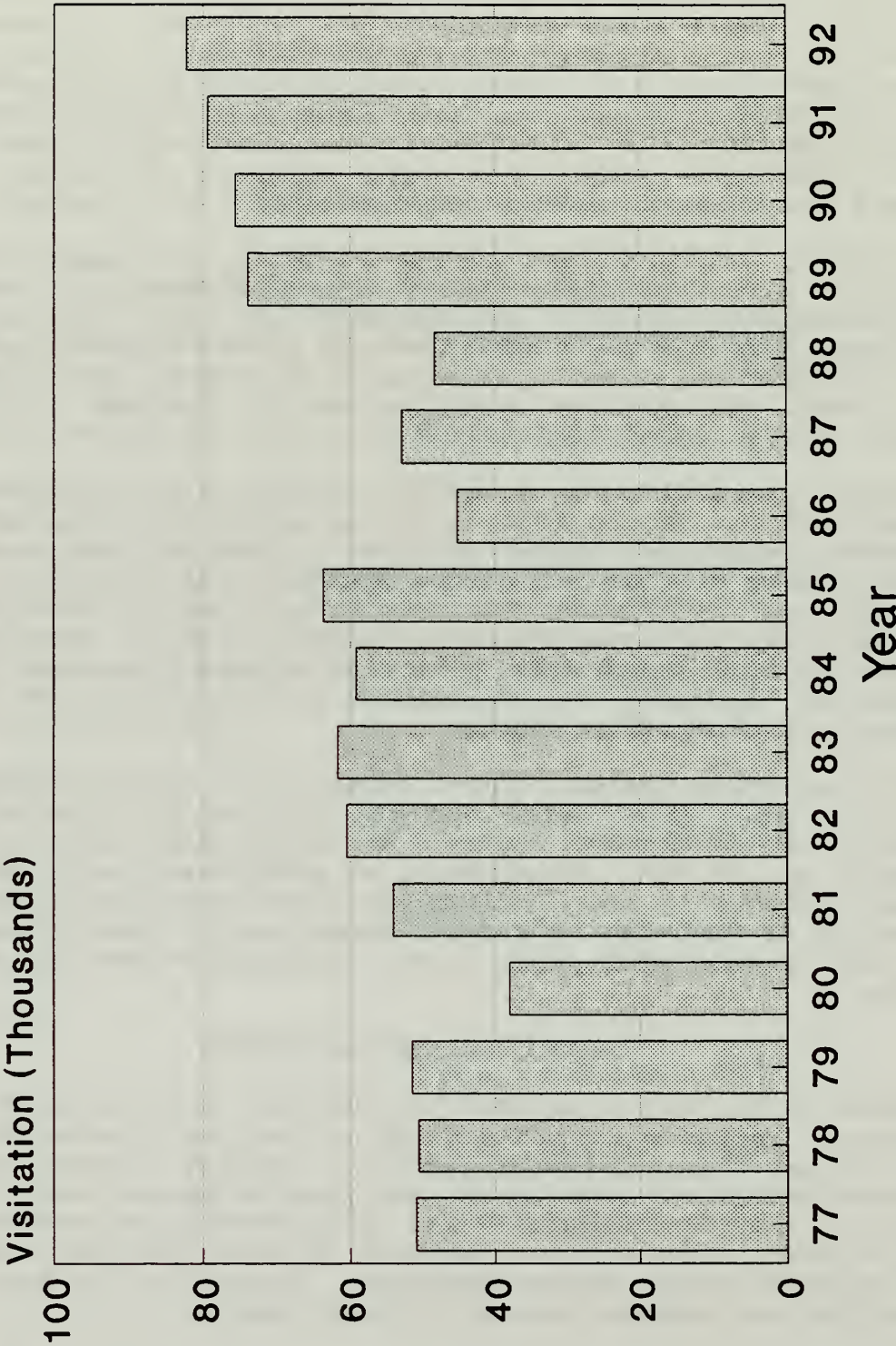


Figure IV-1. Pettigrew Annual Visitation

PETTIGREW AVERAGE MONTHLY VISITATION

1989-1991

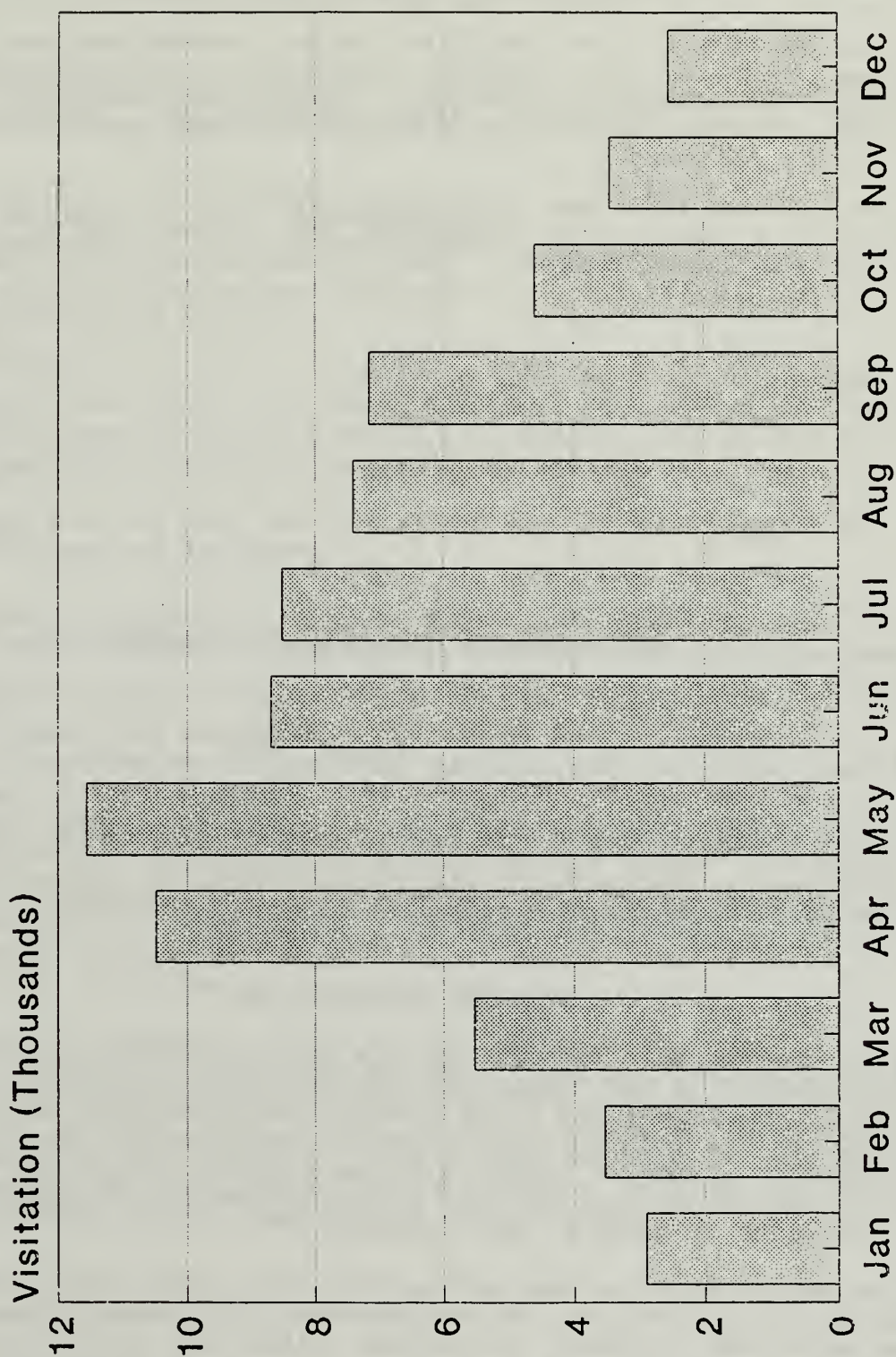


Figure IV-2. Average Monthly Visitation

INTERPRETATION AND EDUCATION TRENDS

In spite of very limited staffing, which constricts the number of programs that can be offered, Pettigrew's interpretation and education programming involves significant numbers of park visitors. The number of participants for the years 1988 through 1992 are as follows:

	<u>Environmental Education</u>	<u>All I & E Programming</u>
1988	1,001	2,195
1989	1,313	2,337
1990	2,000	3,178
1991	1,326	3,568
1992	-	4,393

A good portion of the environmental education participation (approximately 1,200 persons) takes place during Indian Heritage Week.

While interpretation and education attendance has been increasing in recent years, it is unlikely that much future expansion can be expected without staffing increases. Other factors -- such as the lack of indoor facilities with a classroom, lack of a park amphitheater, and lack of exhibit space in which to display pottery and canoes -- also serve to limit the number of visitors that can be reached with interpretation and education programs.

VISITOR INFORMATION

In 1987 the U.S.D.A. Forest Service was contracted by the Department to conduct a Park Areas Recreation Visitors Survey (PARVS) of the North Carolina state parks system visitors in order to identify their socio-economic characteristics and economic contribution to the state's economy. While Pettigrew was not one of the eight parks involved in the survey, some information concerning state park visitors in general was learned.

Why do people visit state park units? The convenient location was cited by 31 percent of the respondents; 25 percent thought other areas were too crowded; 21 percent liked the good facilities; 8 percent wanted to try a new area; 7 percent enjoyed the scenic beauty; and 6 percent came to see the attraction.

A good percentage of park visitors come from within a 30-mile radius (37 percent), while 17 percent come from 30 to 60 miles away. Park visitors surveyed indicated that the parks served as

their sole destination 86 percent of the time. While most visitors come from nearby, the average one-way distance travelled was 139 miles.

Seventy-eight percent of those surveyed indicated that they were return visitors. The average number of return trips per year was six.

Sixty-one percent of visitors statewide came with family members, 16 percent with friends, and 7 percent with family and friends. Ten percent of visitors came alone. Visitors also came in small numbers in organized groups and multiple families. The average group size surveyed was 3.59.

PARVS data indicated that 16.8 percent of groups surveyed used more than one car, and that the average number of persons per car was 3.05. This figure is very close to the three-person-per-car figure used in compiling Pettigrew visitation figures.

The average age of the park visitor was 38.24 years. The age distribution was as follows:

<u>Percent of Visitors by Age Group</u>								
<u>Under 6</u>	<u>6-12</u>	<u>13-18</u>	<u>19-25</u>	<u>26-35</u>	<u>36-45</u>	<u>46-55</u>	<u>56-65</u>	<u>Over 65</u>
6.7	11.6	10.6	12.5	20.1	16.9	0.9	7.3	4.4

Because the PARVS information shown above was gathered at eight park sites, not including Pettigrew State Park, it cannot be considered a valid study of Pettigrew's visitation trends. It is useful, however, in providing a general assessment of the state park system's visitation as well as a general indication of likely visitation at Pettigrew.

Since over 18 percent of visitors are under the age of 13, demand exists for children's programs and facilities. Facilities such as an expanded campground and picnic area and a children's play area would help to meet such needs. Approximately 12 percent of visitors are 56 and older. This older segment of the general population will be increasing, and as it does, demand for improved quality, accessibility, and safety should increase.

NEARBY PARK AREAS AND FACILITIES

Goose Creek is the state park located closest to Pettigrew. It is southwest of Pettigrew, about 35 miles away as the crow flies and about 59 miles driving distance. Goose Creek, located on the Pamlico River, currently contains 1,597 acres of land.

Goose Creek's land base includes brackish marshes, evergreen shrub thickets, hardwood swamp forests, pine forests, cypress trees, sandy beaches, and approximately nine miles of shoreline. Visitor-use facilities there include a park office; a picnic area with running water, grills, and 20 tables; a swimming beach with picnic tables; a primitive family campground containing 12 tent sites, each with a table and grill; a boat ramp; and 6.9 miles of winding hiking trails.

Two other state parks are located within a 50-mile radius of Pettigrew. Jockey's Ridge and Merchants Millpond are each approximately 47 direct miles away and 64 and 53 miles driving distance, respectively.

Although generally serving purposes that differ from state parks, several public gamelands operated by the Wildlife Resources Commission and wildlife refuges operated by the U.S. Fish and Wildlife Service are found in the counties surrounding Pettigrew State Park (Table IV-1).

The Wildlife Resources Commission operates eight public boating access areas within a 50-mile drive of Pettigrew, as shown in Table IV-2.

Partly because of the low population density and small size of communities around Pettigrew State Park, few park and recreation departments exist in the Pettigrew area. While Perquimans County operates a park and recreation department, Bertie, Chowan, Martin, Hyde, Beaufort, Tyrrell and Washington counties do not. Only two municipal departments operate in the area: Edenton and Williamston. Pettigrew probably helps to meet local park and recreation needs not served by local governments.

Table IV-1. Public Game Lands, National Forests, and Wildlife Refuges Near Pettigrew State Park

Name	County(ies)	Agency	Driving Miles	Acres
Alligator River National Wildlife Refuge	Dare	USFWS	54	120,000
Swan Quarter National Wildlife Refuge	Hyde	USFWS	60	15,500
Lake Matamuskeet National Wildlife Refuge	Hyde	USFWS	50	50,000
Pocosin Lakes National Wildlife Refuge	Tyrrell Washington Hyde	USFWS	*	111,000
Bachelor Bay Game Land	Washington Martin	WRC	35	9,446
Gull Rock Game Land	Hyde	WRC	55	19,436
Lantern Acres Game Land	Tyrrell Washington	WRC	9	1,825
Pungo River Game Land	Hyde	WRC	70	614
New Lake Game Land	Hyde	WRC	40	394
Roanoke River Wetlands & Roanoke River National Wildlife Refuge	Bertie Halifax Martin	WRC USFWS	65	12,959

* Pocosin Lakes National Wildlife Refuge includes land that borders Lake Phelps. It includes the former Pungo National Wildlife Refuge.

Table IV-2. Public Boating Access Areas Near Pettigrew State Park

Alligator River

Dare County (East Lake): 12 miles east of Columbia.

Tyrrell County (Gum Neck Landing): 20 miles south of Columbia.

Tyrrell County (Frying Pan): 12.5 miles southeast of Columbia.

Scuppernong River

Tyrrell County (Columbia): One mile west of Columbia off U.S. 64.

Conaby Creek

Washington County (Plymouth): 3 miles NE of Plymouth.

Roanoke River

Washington County (Plymouth): On NC 45.

Chowan River

Chowan County (Edenhouse Bridge): Adjacent to U.S.17.

Chowan County (Cannon's Ferry): 13 miles north of Edenton.

Four private campgrounds are located in the Pettigrew area. These usually offer amenities such as flush toilets and hot showers, sewage disposal, LP gas refill, picnicking, swimming, recreation rooms, fishing, and various sports. The locations and campsite information for these is as follows:

Bath - 27 tent and trailer sites.

Belhaven - 200 semi-wooded sites (65 full hookups; 135 with water and electricity). Open all year.

Edenton - 42 tent and trailer sites (30 with water and electricity). Open May 15 to Labor Day.

Hertford - 35 trailer and tent sites. Open all year.

Washington - 267 tent and trailer sites (50 with water and electricity). Open all year. 120 tent and trailer sites (30 with water and electricity). Open all year.

Williamston - 175 semi-wooded sites (85 full hookups; 70 with water and electricity; 11 no hookups). Open all year.

1990 SCORP standards indicate a need for approximately 138 primitive campsites and 704 tent and trailer sites (842 total) in Beaufort, Bertie, Chowan, Hyde, Martin, Perquimans, Tyrrell and Washington counties. The total number available, including the 13 sites at Pettigrew, 12 at Goose Creek, and the private sites listed above, is 891. Based upon SCORP standards, additional campsites in the area are not needed. The existing 13-site campground at

Pettigrew was filled to capacity 17 times in 1991, however. Development of additional facilities at Pettigrew will also increase the demand for camping.

Because of the abundance of federally owned land and Wildlife Resources Commission Game Lands in the Pettigrew area of North Carolina, SCORP standards do not indicate a need for additional regional park acreage (the category in which state parks fall) or dispersed park acreage in the Pettigrew area. Additional land acquisition at Pettigrew State Park, therefore, would need to be justified by other concerns, such as natural resource protection.

An analysis of other types of park acreage -- neighborhood, community and district -- shows that the Pettigrew area has additional needs for these types of parks. An analysis of SCORP information showed that Beaufort, Bertie, Chowan, Hyde, Martin, Perquimans, Tyrrell, and Washington counties were all low on neighborhood, community, and district park acreage.

DEMOGRAPHIC TRENDS

Pettigrew State Park is located in one of the sparsely populated regions of the state. Washington County, with a population density of 40.25 people per square mile, ranks 82nd of North Carolina's 100 counties in density. Tyrrell County, with 9.89 people per square mile, ranks 99th. The population densities of these counties are far below the 1990 state average of 136.06 people per square mile (Figure IV-3). Surrounding counties are also sparsely populated: Hyde (100th in density); Beaufort (71st in density); Martin (65th in density); Bertie (92nd in density); Perquimans (86th in density); and Chowan (56th in density).

Pettigrew's primary service area excludes Hyde and Beaufort counties, even though these two counties border Washington County. Pettigrew State Park is not easily reached from the south. In addition, residents of Hyde and Beaufort counties would be likely to use the water resources of the Pamlico River, Pamlico Sound, and Lake Mattamuskeet rather than make the long drive to Pettigrew.

Pettigrew State Park's regional visitation comes primarily from Washington and Tyrrell counties, where Lake Phelps is found. To a lesser extent, Martin, Bertie, Chowan, and Perquimans counties also provide visitors. The PARVS data supports this identification of Pettigrew's primary service area.

Figure IV-4 shows the population of the Pettigrew primary service area (Bertie, Chowan, Martin, Perquimans, Tyrrell, and Washington counties) from 1980 to 1990, as well as a projection for the year 2000. As shown, population has remained flat in this area of the state since 1980, and no change in this trend is expected through the year 2000. No increase in visitation at Pettigrew can therefore be anticipated from area population growth.

1990 POPULATION DENSITY PETTIGREW SERVICE AREA

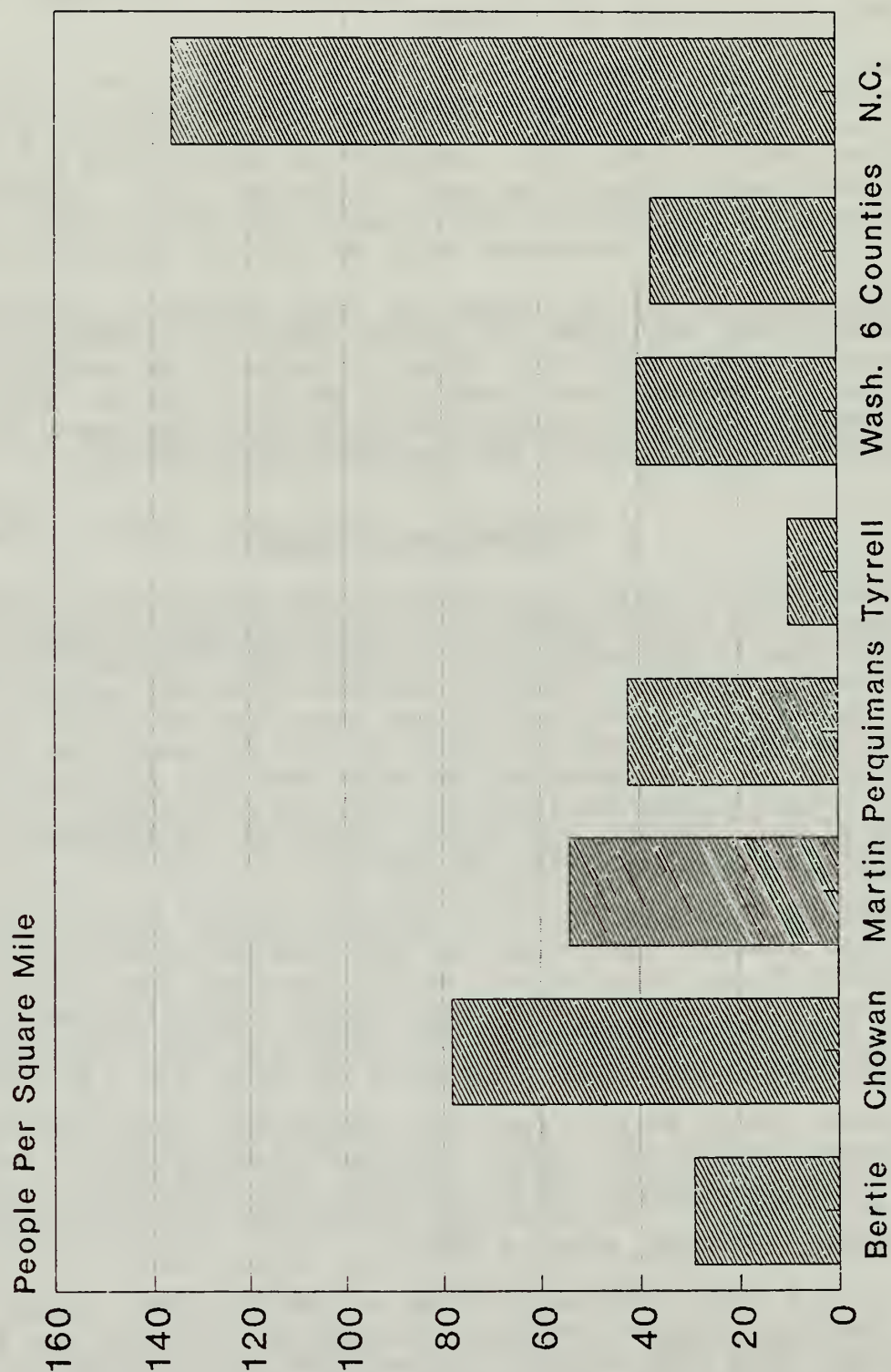


Figure IV-3. Pettigrew Area Density

POPULATION TRENDS 1980 - 2000

PETTIGREW SERVICE AREA

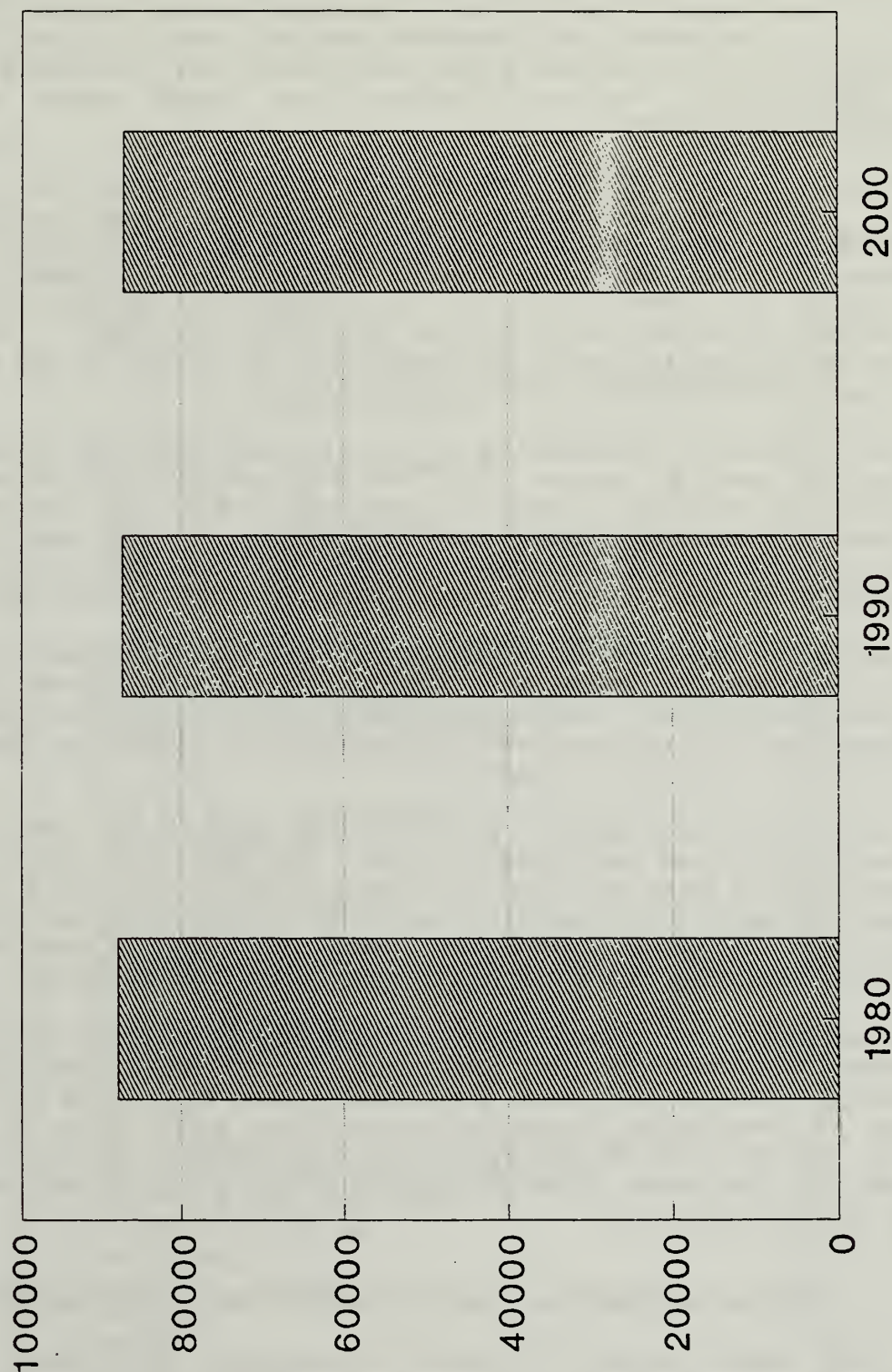


Figure IV-4. Pettigrew Area Population

Since the state's population growth is projected to slow during the 1990's, Pettigrew's historical 3 percent annual growth in visitation is not expected to increase and may even decline slightly. Development of additional park facilities and increased publicity for state parks are two factors that could cause additional visitation increases.

Shifts in the population of various age segments will also take place. Over the past 10 years, the number of women in their prime childbearing years has declined with the aging of the 1940's baby boomers, and the result has been a decline in the number of births. The number of women in their late teens to middle thirties is projected to change little over the next 20 years. Assuming a stable childbearing rate, the number of children in the newborn to four-year-old category will remain stable.

Public-school-age population (5 to 17) has declined significantly during the past 10 years. It has now reached a plateau that is expected to continue. The college age (18 to 24) population has declined in recent years and is likely to continue its small decline before stabilizing at the end of the century. The percentage of the 18-to-34 population started to decline in 1990.

In contrast, the growth in the middle-age and elderly population during the next 20 years is a virtual certainty, thanks to the baby boom of the 1940's. The fastest-growing age segment over the next two decades will be the over-85 segment, followed by the 75-to-84 and then the 65-to-74 segments.

Over the past 10 years, the elderly population has become an increasingly vital political force. For the short-term future, it is anticipated that the growing elderly population will confine its demands primarily to health, nursing homes, activities of daily living, and protective services. Numerous surveys have shown these areas to be among the primary concerns of the elderly.

While shifts in population age groups are particularly significant in school and some social programs, it is not thought that these age-group changes that will be taking place will have a significant effect on Pettigrew State Park over the next five to 10 years. Over a longer period of time, as the elderly population grows, demand for improved services and facilities catering to this age group can be expected.

OUTDOOR RECREATION PARTICIPATION IN NORTH CAROLINA

The five most popular outdoor recreation activities in North Carolina are walking for pleasure, driving for pleasure, viewing scenery, beach activities, and visiting historical sites. Three out of every four households participated in walking for pleasure at least once in the past 12 months (Table IV-3). In addition to

Table IV-3. Outdoor recreation activities ranked by popularity.

Rank	Activity	Percentage of Households Participating
1.	Walking for Pleasure	75%
2.	Driving for Pleasure	72
3.	Viewing Scenery	71
4.	Beach Activities	69
5.	Visiting Historical Sites	62
6.	Swimming (in Lakes, Rivers, and Oceans)	54
7.	Visiting Natural Areas	53
8.	Picnicking	52
9.	Attending Sports Events	52
10.	Visiting Zoos	51
11.	Fishing - Freshwater	50
12.	Use of Open Areas	41
13.	Swimming (in Pools)	40
14.	Fishing - Saltwater	38
15.	Attending Outdoor Cultural Events	35
16.	Bicycling for Pleasure	32
17.	Other Winter Sports	31
18.	Camping, Tent or Vehicle	29
19.	Softball and Baseball	28
20.	Hunting	28
21.	Use of Play Equipment	28
22.	Power Boating	26
23.	Trail Hiking	26
24.	Jogging or Running	24
25.	Basketball	24
26.	Nature Study	22
27.	Golf	22
28.	Target Shooting	20
29.	Water Skiing	19
30.	Camping, Primitive	14
31.	Tennis	14
32.	Use Motorcycles, Dirt Bikes, ATV's	13
33.	Use Four Wheel Drive Vehicles	13
34.	Canoeing and Kayaking	13
35.	Horseback Riding	12
36.	Volleyball	12
37.	Downhill Skiing	12
38.	Football	11
39.	Soccer	7
40.	Sailboating	7
41.	Skateboarding	6
42.	Cross Country Skiing	2
43.	Windsurfing	1

the five most popular activities, over fifty percent of the households responding to a 1989 survey participated at least once in the following activities: swimming (in lakes, rivers, or oceans), visiting natural areas, picnicking, attending sports events, visiting zoos, and freshwater fishing.

The North Carolina Outdoor Recreation Participation Survey was mailed to 3,100 randomly selected residents in the spring of 1989. Forty-five percent, or 1,399 people, returned completed surveys. Each person receiving the survey was asked to estimate the number of times the members of his household had participated in each of 43 activities.

The survey results provide good insight into the current participation of North Carolinians in a wide range of outdoor recreation activities. The most popular activities can be determined by identifying the activities in which the highest percentage of the population participates. The survey results can also identify leisure activities that are important parts of daily routine. These regular activities are ones that respondents report participating in many times during the year.

PRIORITIES OF PUBLIC OUTDOOR RECREATION FUNDING

The North Carolina Outdoor Recreation Survey asked residents to identify and rank their future public outdoor recreation needs. Priorities for publicly funded outdoor recreation were measured by combining ratings for future demand and public funding priorities. Each activity received a rating of high, moderate or low for both future demand and support for public funding.

These ratings were combined to produce a score from one to nine, reflecting an overall priority for which one is the highest priority and nine is the lowest. The combined rating is produced using a matrix that assigns a higher priority to support for public funding than future demand for the outdoor recreation activity (Table IV-4).

Table IV-4. Scoring Matrix for Future Recreation Priorities

Future Demand	Public Support		
	High	Moderate	Low
High	1	3	6
Moderate	2	4	8
Low	5	7	9

Based on this analysis, many of the activities rated as the highest priorities are activities that are currently or could potentially be provided at Pettigrew State Park. The activities include walking for pleasure, tent or vehicle camping, picnicking, freshwater fishing, beach activities, visiting natural areas, viewing scenery, and trail hiking (Table IV-5).

Of the future public outdoor recreation needs identified in the survey, many can be experienced at Pettigrew. As the second fastest-growing recreational activity in the United States, bicycling is already having an impact on state parks in general. Future demand suggests that provisions for cycling may need to be made. While there are not enough roads inside the park for cycling, there are extensive state-maintained roads around the west and south sides of Lake Phelps that might eventually serve cyclists. The park's small land base and fragile natural resources preclude trail construction for such purposes.

Table IV-5. Priorities of Future Outdoor Recreation Activities

Activity	Code
Walking for Pleasure	1
Camping, Tent or Vehicle	1
Picnicking	1
Beach Activities	1
Fishing - Freshwater	1
Attend Outdoor Cultural Events	1
Visiting Natural Areas	2
Use of Play Equipment	2
Visiting Zoos	2
Visiting Historical Sites	2
Bicycling for Pleasure	3
Swimming (in Pools)	3
Viewing Scenery	4
Hunting	4
Trail Hiking	4
Use of Open Areas	4
Target Shooting	4
Swimming (Lakes, Rivers, Ocean)	4
Fishing - Saltwater	4
Camping, Primitive	7
Driving for Pleasure	8
Horseback Riding	8
Golf	8
Attending Sports Events	8
Jogging or Running	9
Nature Study	9
Softball and Baseball	9
Basketball	9
Football	9
Soccer	9
Tennis	9
Volleyball	9
Skateboarding	9
Sailboating	9
Windsurfing	9
Canoeing and Kayaking	9
Power Boating	9
Water Skiing	9
Downhill Skiing	9
Cross Country Skiing	9
Other Winter Sports	9
Use Motorcycles, Dirt Bikes, ATV	9
Use Four-Wheel-Drive Vehicles	9

V. SUMMARY OF LAWS

GUIDING PARK MANAGEMENT

There are many federal and state statutes, state and federal executive orders, and administrative rules and policies that govern the operation of the state parks system. A thorough listing and discussion of these will be available in the Systemwide Policies Manual, which is under development.

This chapter includes a brief discussion of the primary legal basis for the existence and operation of the state parks system.

NORTH CAROLINA CONSTITUTION

Article XIV, Section 5, of the North Carolina Constitution sets overall policy by broadly defining the conservation and protection of natural resources and the acquisition of such resources as a proper function of government. The amendment reads in part as follows:

It shall be the policy of this State to conserve and protect its lands and waters for the benefit of all its citizenry, and to this end it shall be a proper function of the State of North Carolina and its political subdivision to acquire and preserve park, recreation, and scenic areas, to control and limit the pollution of our air and water, to control excessive noise, and in every other appropriate way to preserve as a part of the common heritage of this state its forests, wetlands, estuaries, beaches, historical sites, open land, and places of beauty.

STATE LAWS

STATE PARKS ACT

The State Parks Act (G.S. 113-44.7 through 113-44.14) sets forth a mission statement for the state parks system. It states that the system functions to preserve and manage representative examples of significant biologic, geologic, scenic, archaeologic, and recreational resources, and that park lands are to be used by the people of the state and their visitors and descendants in order to promote understanding of and pride in the state's natural heritage.

The State Parks Act also calls for development and periodic revisions of a System Plan to achieve the mission and purpose of the state parks system in a reasonable, timely, and cost-efficient manner. The Act describes System Plan components and requires that

public participation be a component of plan development and revisions.

The State Parks Act also calls for the classification of park resources and development of general management plans (GMPs) for each park. GMPs are to include a statement of park purpose, an analysis of major resources and facilities, and a statement of management direction.

POWERS AND DUTIES OF THE DEPARTMENT OF ENVIRONMENT, HEALTH, AND NATURAL RESOURCES

This act authorizes the Department to make investigations of the resources of the state and to take such measures as it may deem best suited to promote the conservation and development of such resources. The Act also authorizes the Department to care for state forests and parks and other recreational areas now owned, or to be acquired by the state. (G.S. 113-8)

STATE NATURE AND HISTORIC PRESERVE DEDICATION ACT

The State Nature and Historic Preserve Dedication Act (G.S.143-260.6) was authorized by Article 14, Section 5, of the North Carolina Constitution. It seeks to ensure that lands and waters acquired and preserved for park, recreational and scenic areas for the purpose of controlling and limiting the pollution of air and water, controlling excessive noise, and in every other appropriate way preserving as a part of the common heritage of the state, continue to be used for those purposes. The State Nature and Historic Preserve therefore provides a strong legal tool for protecting lands from incompatible uses.

The addition and removal of lands to and from the State Nature and Historic Preserve require a law enacted by a vote of three-fifths of the members of each house of the General Assembly.

All lands within the boundaries of Pettigrew State Park as of April 4, 1989, with the exception of the portion of that tract described in Deed Book 257, page 479, lying south of S.R.1183 or the extension thereof along its present right-of-way, are included in the State Nature and Historic Preserve.

NORTH CAROLINA ENVIRONMENTAL POLICY ACT OF 1971

Recognizing the profound influence that man's activity has on the natural environment, the General Assembly passed the Environmental Policy Act "to assure that an environment of high quality will be maintained for the health and well-being of all..."

The Act declares that:

It shall be the continuing policy of the State of North Carolina to conserve and protect its natural resources and to create and maintain conditions under which man and nature can exist in productive harmony. Further, it shall be the policy of the State to seek, for all its citizens safe, healthful, productive, and aesthetically pleasing surroundings; to attain the widest possible range of beneficial uses of the environment without degradation, risk to health or safety; and to preserve the important historic and cultural elements of our common inheritance. (G.S. 113A-3)

While there are other General Statutes that concern the state parks system and the environment, the above-described statutes, along with Article XIV, Section 5, of the North Carolina Constitution, largely define the purposes of the state parks system and serve to guide the operation of state park system units.

STATE LAKES LEGISLATION

The North Carolina General Assembly in 1929 passed legislation that directed:

...that all lakes now belonging to the State, having an area of fifty acres or more, shall never be sold nor conveyed... but shall always be and remain the property of the State of North Carolina for the use and benefit of all the people of the State to be administered as provided for other recreational areas now owned or to be acquired by the State.

(1929, c.165)

As a state lake, Lake Phelps is subject to state lakes regulation that relate to piers and docks and watercraft rules.

COASTAL AREA MANAGEMENT ACT

Because of their inherent natural significance in the coastal environment, certain "areas of environmental concern" (AEC) are defined by and protected under the Coastal Area Management Act (CAMA). (G.S.113A-100 et.seq.) Activities within an AEC require permits, obtained from the N.C. Division of Coastal management, in addition to any other required state or local permits. Areas of environmental concern defined by the act include:

- Estuarine systems: sounds, bays tidal waters, inland fishing waters, marshes and shorelines.
- Public water supply: watersheds and well fields.
- Natural and cultural resources: areas of historic, aesthetic, scientific, or biological significance.

Lake Phelps is a public trust AEC. Questions regarding AEC regulation should be directed to the Division of Coastal Management in Washington, North Carolina (919-946-6481).

FEDERAL LAWS

LAND AND WATER CONSERVATION FUND ACT OF 1965

The federal Land and Water Conservation Fund Act (PL 88-578) offers protection and places restrictions on fund-assisted outdoor recreation areas.

By virtue of receiving Land and Water Conservation Fund (LWCF) grant assistance, most of the state parks system, including 769 acres of Pettigrew State Park, is subject to LWCF rules and regulation. The 769 acres include all of the park's land base at the time of LWCF assistance. Other land has been subsequently added to the park. Property acquired or developed in whole or in part with LWCF assistance cannot be converted to other than public outdoor recreation use without federal approval. A conversion may only take place if approved by the secretary of the Interior, and only then if replacement property of equal fair market value and reasonably equivalent usefulness and location is made.

LWCF requirements include: programming, operating and maintaining areas in a manner that encourages public participation; maintaining the property so it appears attractive and inviting to the public; maintaining property, facilities and equipment to provide for public safety; keeping facilities, roads, trails and other improvements in reasonable repair throughout their lifetime to prevent undue deterioration and encourage public use; keeping the park and facilities open for use at reasonable hours and times; and making future development meet LWCF rules and regulations. LWCF-assisted sites are periodically inspected by state and federal inspectors to ensure compliance with LWCF requirements.

CLEAN WATER ACT

Pettigrew State Park has extensive wetland areas. In addition to being protected by the state's CAMA regulations, these sensitive areas also receive some protection from Section 404 of the federal Clean Water Act. The Act prohibits the discharge of dredge or fill materials into waters, including wetlands, without a permit from the U.S. Army Corps of Engineers. Activities in wetlands for which permits may be required include, but are not limited to: placement of fill material; ditching activities when excavated material is side cast; land clearing involving relocation of soil material; land leveling; most road construction; and dam construction. (33 USC 1344) The Division will avoid undertaking construction located in wetlands unless there is no practical alternative and all practical measures are taken to minimize harm to the wetland.

PETTIGREW MASTER PLAN

A master plan for Pettigrew State Park was completed in 1977. The plan serves as a guide for development and management of park resources. It includes an analysis of cultural and natural resources as well as site analysis and development recommendations.

The master plan still serves to guide overall park development. During the general management plan process, the existing master plan was reviewed to determine if master plan proposals are still valid or if modifications are needed. GMP evaluation determined that changes to the master plan are needed. These changes are detailed in Chapter VII.

PETTIGREW DEED RESTRICTIONS

In 1947, the U.S. Department of Agriculture deeded 203 acres to the state of North Carolina. The land was conveyed as a state park to be used exclusively for state park and public recreational purposes. The land is subject to certain restrictions and conditions, including:

- that the state will establish and maintain the property, including all buildings located thereon, exclusively for state park and public recreational purposes; will administer the said park in the best interest of long-time public use; and will not use the property or permit the property to be used in competition with companies or organizations in the area furnishing adequate services to the inhabitants upon reasonable rates and terms;
- that the state will use reasonable care in construction, maintaining, and operating the sluice gates to keep Lake Phelps at such level as will save adjoining landowners harmless from overflow of water from said lake.

If conditions and restrictions specified in the deed are not followed, the land could revert to the federal government.

LAKE PHELPS MANAGEMENT STUDY

In March of 1980, a management plan was developed to address flooding frequencies and durations while maintaining and enhancing the natural and recreational environments of Lake Phelps. The plan establishes an optimum water level range to ensure the ecological integrity of the lake, maximize outdoor recreation benefits, and prevent (when possible) any deterioration of the land neighboring the lake that would result from flooding.

The plan calls for a fluctuating lake level between 10.73 feet and 11.67 feet above mean sea level. The resultant average optative lake level will approach 11.26 feet, and the managed mean high

water level will be at 11.5 feet. The plan also divides the year into four hydro-period management phases.

The plan also recognizes that the lake level is largely governed by precipitation amounts and durations as well as wind velocities and directions. As a result, there will be times when the lake level cannot be controlled.

VI. NATURAL AND CULTURAL RESOURCE MANAGEMENT

NATURAL RESOURCE MANAGEMENT POLICY

The Division of Parks and Recreation's approach to natural resource management is directed by the North Carolina Constitution and the State Parks Act, both of which require the management of natural resources. The constitution sets overall policy by broadly defining the conservation and protection of natural resources and the acquisition of such resources as a proper function of government. The State Parks Act states that unique archaeological, geological, biological, scenic, and recreational resources are a part of the heritage of the people, which "...should be preserved and managed by those people for their use and for the use of their visitors and descendants."

The North Carolina State Parks System plays an important role in maintaining, rehabilitating, and perpetuating the state's natural heritage. The natural resources of the state parks system are: high quality, rare or representative examples of natural communities; native plants and animals; geological features and landforms; water resources; and the natural processes that affect these elements. The primary objective in natural resource management will be the protection of natural resources for their inherent integrity and for appropriate types of enjoyment while ensuring their availability to future generations.

It is the policy of the Division that natural resources will be managed by allowing natural environments to evolve through natural processes with minimal influence from human activities. Resource management will not attempt solely to preserve individual species or individual process; rather, it will try to maintain all the components and processes of naturally evolving ecosystems. When intervention is necessary, direct or secondary effects on park resources will be minimized to the greatest extent possible. Intervention with natural processes may occur:

- 1) to correct or compensate for the disruption of natural processes caused by human activities;
- 2) to protect, restore, or enhance rare species;
- 3) to protect, restore, or enhance significant archaeological resources;
- 4) to construct, maintain, improve, or protect park facilities; and
- 5) to prevent danger to human health and safety.

NATURAL COMMUNITIES

The communities described below follow the *Classification of the Natural Communities of North Carolina: Third Approximation* (Schafale and Weakley, 1990).

NATURAL LAKE SHORELINE

Since most of Lake Phelps' shoreline is undeveloped, this community type is very well represented at Pettigrew State Park. This is a complex community type with many zones, ranging from emergent aquatic plants to shrub thickets, swamps, and bottomland hardwood forests. Distinguishing the boundary where lake-controlled hydrology gives way to the terrestrial hydrology of the surrounding area is difficult in most areas around Lake Phelps, since the transition is generally into other wetland communities and thus very gradual. This community occurs mainly on the lake's north and east sides and includes stands of bald cypress (*Taxodium distichum*) with trees over six feet in diameter; it also includes swamp chestnut oaks (*Quercus michauxii*) over five feet in diameter. Depending on local hydrology, other species include sweet gum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), swamp tupelo (*Nyssa biflora*), water hickory (*Carya aquatica*), and tuliptree (*Liriodendron tulipifera*). The shrub layer is sparse and the herb layer includes graminoids and aquatic species in the wetter zones and numerous non-indigenous species in dryer, more upland zones. The community on the south side of the lake is dominated by emergent grasses and sedges which form important cover and feeding habitat for many species of fish. Other sections of the shoreline are dominated by shrubs and small trees, including red bay, (*Persea borbonia*), Virginia sweetspire (*Itea virginiana*), titi (*Cyrilla racemiflora*), wax myrtle (*Myrica cerifera*), and hollies (*Ilex* spp.).

POND PINE WOODLAND

This is a widespread community type that occurs in a variety of environments. Most of the southern tract of Pettigrew supports this community type, but this area also grades into small pockets of other community types, including Bay Forest and High Pocosin. The soils associated with these communities are poorly drained and vary from highly organic histosols to nutrient poor mineral soils with organic surface layers. Pettigrew's Pond Pine Woodland is wet and nutrient poor and has a substantial pond pine (*Pinus serotina*) canopy; loblolly bay (*Gordonia lasianthus*) occurs as a co-dominant. Much of the pond pine canopy was destroyed by intense fires in the last decade, and canopy closure varies considerably. Other species have recovered from the fires quite rapidly and species diversity is quite high. The subcanopy and shrub layers are typically impenetrable thickets of red bay, titi, sweetbay magnolia (*Magnolia virginiana*), fetterbush (*Lyonia lucida*), gallberry (*Ilex coriacea*), and inkberry (*I. glabra*).

PEATLAND ATLANTIC WHITE CEDAR

There are reports that at least one small pocket of this community type occurs within the Pond Pine Woodland. However, all or nearly all of the Atlantic white cedars (Chamaecyparis thyoides) may have been killed by recent fires.

NONRIVERINE WET HARDWOOD FOREST

The recently acquired tract on the northeast side of the lake, referred to as the Weyerhaeuser Tract, appears to fall into this community type. The canopy is diverse and includes many exemplary trees, including swamp chestnut oak up to 28" diameter-at-breast-height (dbh), cherrybark oak (Q. pagoda) up to 30" dbh, tuliptree up to 30" dbh, and sweet gum up to 25" dbh. Other canopy species include sycamore (Platanus occidentalis) and loblolly pine (Pinus taeda). Understory species include American holly (Ilex opaca), common pawpaw (Asimina triloba), the State Co-champion sweetleaf (Symplocos tinctoria), red bay, red maple, and ironwood (Carpinus caroliniana). Patches of cane (Arundinaria gigantea) and veinous shrubs are scattered throughout. Wetter areas grade into Non-riverine Swamp Forest vegetation with bald cypress and swamp tupelo; sites with dryer, more upland microclimates support components of the Mesic Mixed Hardwood community, including American beech (Fagus grandifolia).

NATURAL HERITAGE PROGRAM ELEMENT OCCURRENCES

SEVEN-ANGLED PIPEWORT (Eriocaulon aquaticum)

This aquatic species has been assigned Significantly Rare status. It is reported to be abundant in the Natural Lake Shoreline Community along the south shore of Lake Phelps in water up to 2.5 feet deep and has also been reported from the north shore in the Pettigrew Cypress Registered Natural Heritage Area. It is found in association with rushes (Juncus spp.), bulrushes (Scirpus spp.), and quillwort arrowhead (Sagittaria isoetiformis). Monitoring is needed to assess the impacts from major draw-downs of Lake Phelps for fire fighting and from residential development on the south shore.

LEAFLESS WATERMILFOIL (Myriophyllum tenellum)

This aquatic species is a Candidate for state listing and occurs in the Natural Lake Shoreline Community along the lake's south shore in water less than one foot deep. It has also been reported from the north shore in the Pettigrew Cypress Registered Natural Heritage Area as well as other locations around the lake. It is

found in association with quillwort arrowhead, seven-angled pipewort, and northeastern bladderwort (Utricularia resupinata). Monitoring is needed to assess impacts to the population from past major draw-downs of Lake Phelps for fire fighting and from residential development on the lake's south shore.

NORTHEASTERN BLADDERWORT (Utricularia resupinata)

This aquatic species has been assigned Significantly Rare status. It has been reported from the north shore of Lake Pettigrew in the Pettigrew Cypress Registered Natural Heritage Area and occurs in water up to one foot deep. It is found in association with seven-angled pipewort and leafless watermilfoil. Monitoring is needed to assess impacts to the population from past major draw-downs of Lake Phelps for fighting fires.

COOPER'S HAWK (Accipiter cooperii)

This species has Special Concern status. A three year bird survey completed in 1990 listing observations in a 15 mile radius of the park included 122 bird species, including the Cooper's hawk. Suitable but limited nesting and foraging habitat are available in the park. The creation of the Pocosin Lakes National Wildlife Refuge and restoration of natural communities adjacent to the park should improve habitat for this and other species. Inventory and monitoring of potential breeding habitat of this species is needed.

BALD EAGLE (Haliaeetus leucocephalus)

This species has Endangered status at both the state and federal levels. Staff have reported infrequent sightings of the eagle. It typically inhabits mature forests near large bodies of fresh water. The creation of the Pocosin Lakes National Wildlife Refuge should increase sightings by improving nesting and foraging habitat.

BLACK VULTURE (Coragyps stratus)

This species has Special Concern status and is included in the bird survey completed in 1990. Suitable nesting and foraging habitat is available in the park's forested areas. The creation of the Pocosin Lakes National Wildlife Refuge and restoration of adjacent natural communities should improve habitat for this species.

RED WOLF (Canis rufus)

The red wolf has Endangered status at both the state and federal levels. The species is native to this area and has recently been reintroduced in the region. One red wolf lives east of Lake Phelps and visits the park's south and west sections periodically. Other

wolves may possibly be released at the wildlife refuge in the near future.

EASTERN COUGAR (Felis concolor)

This species is listed as Endangered at both the state and federal levels and is believed to be extirpated from the region. Cougars inhabit remote forested areas and could be reintroduced into the nearby Pocosin Lakes National Wildlife Refuge. Unsubstantiated cougar sitings have been periodically made in the area.

BLACK BEAR (Ursus americanus)

Although this animal has Significantly Rare status, it is also classified as a game species and therefore by law cannot be listed for state protection as Threatened, Endangered, or Special Concern. Sightings of this species have been reported in the park and other areas around Lake Phelps. Sightings and populations should increase as habitat improves in the adjoining Pocosin Lakes National Wildlife Refuge.

WACCAMAW KILLIFISH (Fundulus waccamensis)

This species is a Proposed Special Concern species. It was reportedly collected from Lake Phelps or the adjacent canals in 1975 and in 1984. The species is endemic to North Carolina and occurs only in Lake Waccamaw and Lake Phelps.

AMERICAN ALLIGATOR (Alligator mississippiensis)

This species is listed as Threatened at the state and federal levels, and there are reports of this species from the vicinity of the park, especially to the south. The species is believed to have occurred in the area in the past and will likely be found in the park in the future.

REGISTERED NATURAL HERITAGE AREAS

PETTIGREW CYPRESS REGISTERED NATURAL HERITAGE AREA

This area covers 40 acres on the north shore of Lake Phelps. It supports an excellent example of a Natural Lake Shoreline Community consisting of a mixed Wetlands Hardwood Forest and a mature bald cypress-herb fringe. This area protects a community type that was once previously widespread but has been largely lost as a consequence of land clearing, drainage and canal building, and logging. Some of the cypress trees are in excess of 100 feet tall and 50 inches in diameter, placing them among the largest trees to be found on the Albemarle Peninsula.

LAKE PHELPS REGISTERED NATURAL HERITAGE AREA

This Registered Natural Heritage Area covers all of 16,600 acre Lake Phelps, which is the second largest natural lake in the state. Classified as a Carolina Bay Lake, this shallow lake has an average depth of 4-1/2 feet and a very small watershed. The lake receives most of its water from rainfall, and because of its relatively high topographical location pollution from overland runoff is minimal and the lake's water quality is excellent. The lake supports over two dozen fish species, including the Waccamaw killifish, which is known from only one other location in the state. At least 120 bird species have been observed within a 15 mile radius of the lake, and numerous migratory birds utilize Lake Phelps as a resting place and sanctuary during winter. The lake's shores support outstanding examples of the Natural Lake Shoreline community type and feature numerous exemplary trees, some of which exceed 5 feet in diameter.

The lake appears to be in good condition and water levels are approaching normal levels following the excessive pumping for fire control in 1985. Assessment of the impact of the pumping is difficult, however, due to a lack of baseline and monitoring data.

POTENTIAL ADDITIONS TO THE REGISTERED NATURAL HERITAGE AREAS

The Pond Pine Woodland community on the south side of Lake Phelps should be registered. Despite the intense fires of 1981 and 1985, the quality of the core community and its variants makes the area suitable for registry and offers great potential for Interpretation and Education. Evidence of black bear and the potential occurrence of other animal species magnifies the importance of this area. The red wolf has visited this area.

The Nonriverine Hardwood Forest community in the recently acquired Weyerhaeuser Tract and the Natural Lake Shoreline community linking it with the lake should be registered. Additional work is needed to determine if the community type is properly designated, but this high quality area is suitable for registry even if the community

designation changes. Although past logging is evident, the number of large canopy and subcanopy trees, including the State Co-champion sweetleaf, makes the area worthy of protection.

CULTURAL AND NATURAL RESOURCE MANAGEMENT ISSUES

EXOTIC SPECIES

Terrestrial: Several exotic plant species are present in the park, particularly in disturbed areas or old home sites. An effort should be made to determine the identity, location, and extent of these species and, where practical, they should be removed. Some of these plants are ornamental species associated with the historic Somerset Plantation, and their control should be evaluated in light of their contribution to the park's cultural resources.

Aquatic: Several exotic species, including hydrilla and alligator weed, have been found in the canals around Lake Phelps, but none has shown up in the lake. The North Carolina Aquatic Weed Control Program is addressing control of these species. Regular monitoring and an assessment of potential control measures are needed should any of the species escape into the lake.

FIRE MANAGEMENT

A fire management plan for Pettigrew State Park has been developed. The park adjoins lands with a high degree of fire danger, and two major wildfires have occurred in the area since 1980. Water levels in Lake Phelps were lowered significantly when lake water was pumped out and used to suppress major fires in 1981 and 1985. The lowered water levels are believed to have been detrimental to the park's natural and cultural resources, but no baseline data were available to demonstrate or quantify impacts.

It is probably unrealistic to expect that we will be able to completely prevent future use of the lake's water for fire fighting. However, improved management of the land south of the lake could reduce the frequency and volume of such use. As part of the preparation of the park's fire management plan, a cooperative agreement outlining guidelines for lake water use should be explored between the Division of Parks and Recreation and the U.S. Fish and Wildlife Service.

EXTERNAL THREATS

Homeowners adjacent to the lake were given verbal permission by a past Director to cut underbrush on park property so that they could view the lake and receive breezes from the lake. The continued allowance of this practice runs contrary to accepted park management policies and is detrimental to the park's natural resources. Private cutting of park vegetation should be discontinued.

NATURAL RESOURCE INVENTORIES

A complete biological survey of the park is needed, and resource inventories should be a priority on all newly acquired parcels. Botanical survey work is particularly vital in the park's disturbed areas since logging, drainage, vegetation clearing, and farming have altered community structure and allowed a wide variety of exotic species to become established.

Survey work on the park's aquatic habitat is needed to determine the potential presence of two rare salamander species, the dwarf and tiger salamanders. Although suitable habitat exists, neither has been previously reported from the park.

Inventory data should be kept on file at the park and the superintendent should work with NHP staff to monitor the status of rare species.

LAKE LEVEL MANAGEMENT

A lake management study prepared by the Division in 1979 recommended keeping lake levels under 11.5 feet msl for most of the year through a seasonally adjusted schedule of control gate openings and closings. Since then, the lake's level has been extremely low as a result of the combined effects of draw downs for fire fighting and several consecutive years of drought. Consequently, the water release schedule recommended by the management plan has not been implemented. More recently, lake levels have approached 11.5 feet msl and consideration should be given to implementing the plan. Priority should be given to insuring that canals and gates are in proper working order and silt should be removed from the canal mouths to ensure adequate water flow. Dredging of the canals requires a CAMA permit from the Division of Coastal Management and/or a Section 404 permit from the Corps of Engineers. Careful records should be maintained detailing dates of gate openings and closings, lake levels, weather conditions, etc. These baseline data will be critical for proper evaluation of the plan.

The lake management study states that the superintendent should notify his supervisors and the Lake Phelps Advisory Committee of the intent to release water into the canals a minimum of three days prior to planned gate openings. In certain circumstances such as hurricanes or heavy rain storms, the superintendent has the authority to release water on an emergency basis. In such cases, the superintendent should notify the committee and supervisors on an after-the-fact basis.

CULTURAL RESOURCES

Pettigrew is notable for its rich prehistoric and historic cultural resources. Particularly notable is a significant number of large, high quality dugout canoes over 1,500 years old that have been

found in Lake Phelps. These canoes include the second oldest such canoe known in the country (4,380 years). A unique variety of pottery has also been found in the park. The Office of State Archaeology should catalog all of the park's artifacts and a copy should be kept on file at the park.

Historic resources include the Somerset Plantation, which depicts 19th century plantation life, as well as other old homesites. The plantation is administered by the Department of Cultural Resources and a Memorandum of Understanding between the agencies for the plantation's long term management has been developed. The Pettigrew homesite and cemetery are located on the Furlough Tract.

ENVIRONMENTAL COMPLIANCE

Any future facility development, whether in the main park area or along the lake's southern shoreline, should be preceded by careful planning and evaluation of the potential impacts to natural and cultural resources. Many laws and regulations govern development activities in wetland areas and the park superintendent should become familiar with all applicable laws to avoid any unintentional violations arising from construction projects.

RESOURCE MANAGEMENT PLAN

The Pettigrew State Park Advisory Committee recommends that a study be done on the numbers of fish being removed from Lake Phelps and consideration be given to limiting the numbers of fish kept. The committee also recommends keeping records of the number of bass tournaments held on the lake.

A comprehensive, park-specific resource management plan addressing the above-mentioned and future resource management issues should be developed. This plan should include detailed actions whose implementation will prevent or correct resource threats or damage. The addition of district resource management specialists would facilitate the development of this plan.

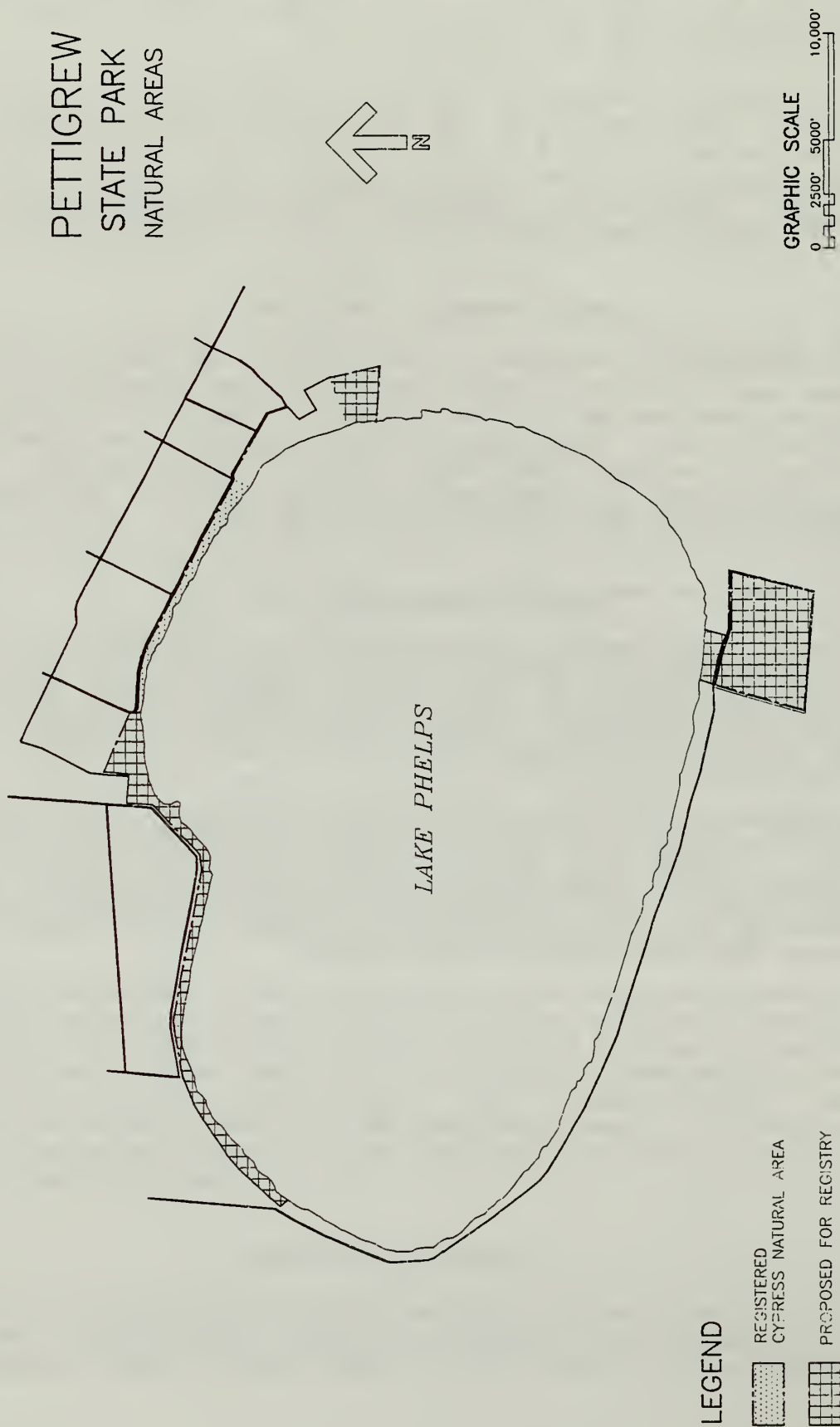


Figure VI-1.

VII. PHYSICAL PLANT INVENTORY

FACILITY INVENTORY AND INSPECTION PROGRAM

The buildings in state parks are needed for park operations and visitor services. These buildings and facilities are essential components of protecting the public's health and safety. They include facilities providing safe drinking water, restrooms, and electricity, as well as recreation facilities such as bathhouses, group camps, and cabins. Without proper maintenance, these facilities are, at best, a disservice to the citizens who use them, and at worst, potentially harmful.

The Facility Inventory and Inspection Program (FIIP) is a computer-based system used to track the condition, maintenance needs, and repair costs of every building in the state parks system. A principal objective of FIIP is to identify deficiencies that may affect health, fire, or life safety. Other objectives are to identify accessibility deficiencies and other significant maintenance-related deficiencies.

During a field evaluation of each facility, deficiencies are given priority ratings of critical, serious, or minor. The deficiencies are classified in nine basic categories: site (the grounds and walkways surrounding the building); exterior envelope; interior envelope; fire/life safety; handicapped accessibility; public health; heating/ventilation/air conditioning (HVAC); plumbing; and electrical.

The field evaluation begins with an inventory of all structures in the park. The results of the inventory are presented using the building name and state property numbers as identification. Next, the types of repairs and repair costs are listed for each building. Finally, the cost summary for the park is given using the nine basic categories of repairs (e.g. exterior envelope) and the three levels of deficiencies (critical, serious, and minor).

PETTIGREW STATE PARK BUILDING INVENTORY

<u>CODE</u>	<u>BUILDING NAME</u>	<u>IN USE</u>
008001	Residence	Y
008002	Wellhouse	Y
008003	Washhouse	Y
008004	Information Center	Y
008005	Park Office	Y
008006	Cooper House	N
008007	Pumphouse	Y
008008	Barn	N
008009	Picnic Shelter	Y
008010	Storage Building	Y
008011	Pit privy	Y
008012	Temporary barracks	N

FACILITY IMPROVEMENT AND REPAIR NEEDS

Inspection of buildings at Pettigrew revealed that they are generally in good condition. None of the buildings require extensive repairs, and five of the 12 require no work at all. Only those building requiring work are shown.

FACILITY MAINTENANCE NEEDS

<u>Bldg#</u>	<u>Building Name/Need</u>	<u>Demolition Cost</u>	<u>Repair Cost</u>
008-001	<u>Residence</u>		\$ 21,058
	Add gas line shut off		150
	Replace wood pier with CMU		422
	Replace 20SF porch decking; new wood siding; add vents; sump pump and foundation drain		20,360
	Add directory for electric panel		68
	Patch cracked plaster & repaint		60
008-003	<u>Washhouse</u>		\$ 6,253
	Provide curb cut & sidewalk		2,208
	Remount water fountain & rebuild WC stall for accessibility		3,977
	Add directory for electric panel		68
008-004	<u>Information Center</u>		\$ 840
	Provide stone base path & accessible threshold		135
	Pave parking area & provide HC parking		705
008-005	<u>Park Office</u>		\$ 1,455
	Put portion of electrical wiring in conduit		150
	Rebuild 3 thresholds to be less than 1/2-inch high		396
	Remount urinal to HC accessible height		834
	Replace damaged wood in garage door		75
008-006	<u>Cooper House</u>	\$ 5,057	
	Building is in poor condition and should be demolished		
008-008	<u>Barn</u>	\$ 843	
	Building is in poor condition and is a safety hazard		
	1/31/92 TOTALS	\$ 5,900	\$ 29,606

PETTIGREW STATE PARK
FACILITY REPAIR NEEDS COST SUMMARY

<u>DEFICIENCY CATEGORY</u>	<u>PRIORITY 1 (CRITICAL)</u>	<u>PRIORITY 2 (SERIOUS)</u>	<u>PRIORITY 3 (MINOR)</u>	<u>CATEGORY SUBTOTAL</u>
SITE	0	21517	5056	26573
EXTERIOR ENVELOPE	0	781	75	856
INTERIOR ENVELOPE	0	0	60	60
FIRE/LIFE SAFETY	0	0	0	0
HANDICAPPED ACCESS	0	7581	0	7581
PUBLIC HEALTH	0	0	0	0
HVAC	150	0	0	150
PLUMBING/UTILITY	0	0	0	0
ELECTRICAL	150	0	135	285
=====	300	29879	5326	35505

Deficiencies that are a threat to fire and life safety or the health of an individual are considered to be "critical." A "serious" deficiency is one that is not considered a threat to fire and life safety, but which could cause further damage to the structure if left uncorrected. This category usually includes building code violations. "Minor" deficiencies are those requiring general maintenance and repair.

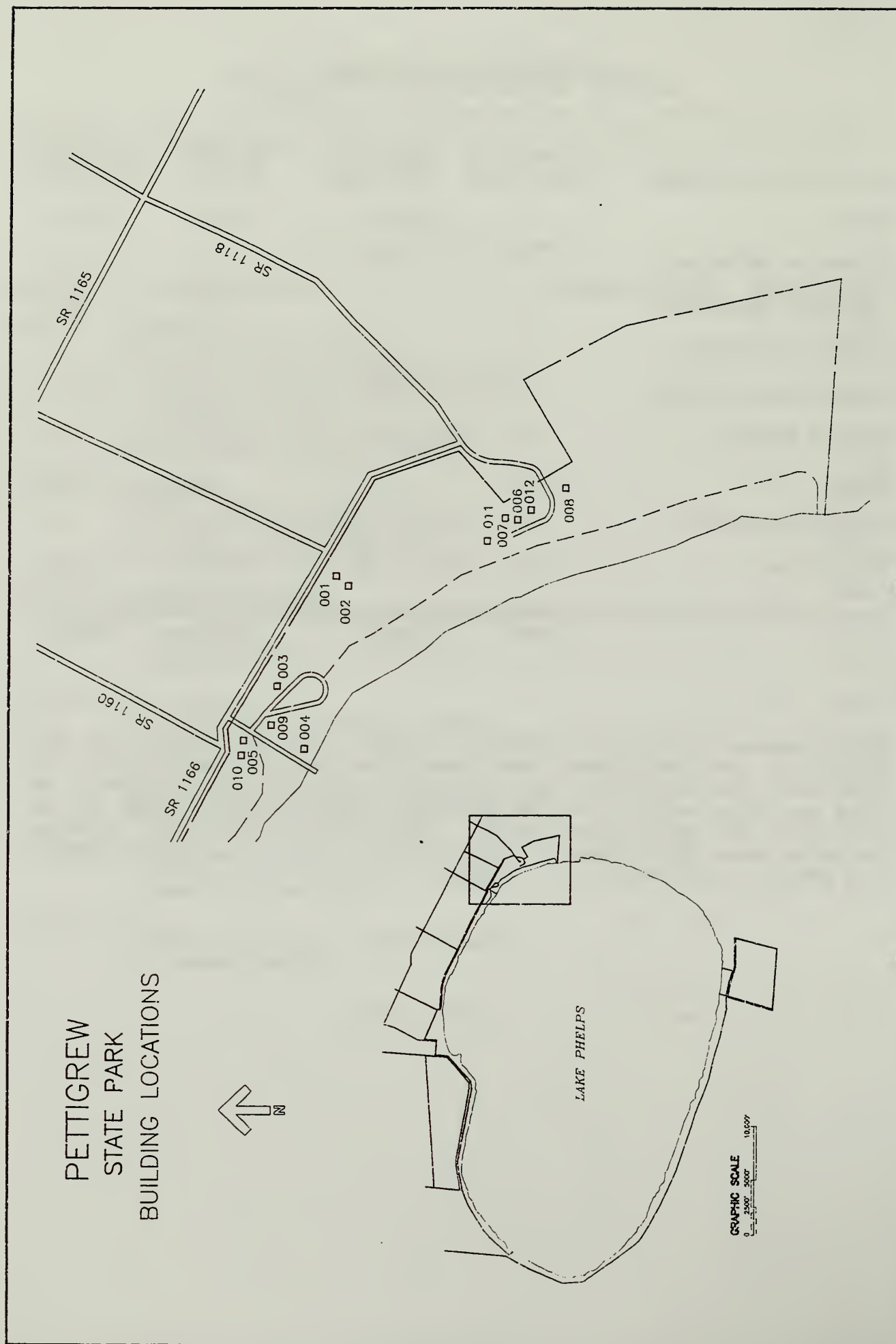


Figure VII-1.

ROAD & UTILITY INVENTORY

This section contains a brief description of the existing park infrastructure (roads, water, sewer, electrical, telephones and, in this park, the water control gates) and makes general recommendations for upgrading and maintaining these systems. Information is based on a one-day park inspection on January 10, 1992 by design and park staff. Other information comes from the Institute for Transportation Research and Education (ITRE) study on roads, from original construction drawings, and from past experience with construction projects at the park.

The park has had limited development over the years. The primary construction of the facilities took place in 1965 and included the boat ramp and jetty. In 1969, the family campground, with 13 sites and a washhouse, was constructed, and in 1978 the combination park office and maintenance shop was built. Since 1978, a lake control structure (built on Moccasin Canal in 1981 and replaced in 1985) has been the only capital improvement within the park. The park master plan calls for major development in the park, but lack of funds and environmental concerns have delayed further development.

This section is divided into six subsections: roads and parking areas; sewer system; water system; electrical system; telephone system; and lake-control structures. Each subsection is broken into two parts: existing conditions and recommendations for repair.

Most of the park's infrastructure is in fair to good shape. Because of the age of the facilities, the water distribution systems need replacing, but the sewer systems are in fairly good shape. The roads and parking areas will need paving in the next two years. The power and telephone systems are satisfactory. The lake structures are operable, but the canal systems are in very poor shape.

EXISTING CONDITIONS - ROADS AND PARKING AREAS

According to the Institute for Transportation Research and Education (ITRE) Study completed in March 1990, there are .05 miles of paved road, two miles of unpaved roads, 1,583 square yards of paved parking areas, and 1,351 square yards of unpaved parking areas at Pettigrew State Park.

The parking lot and the paved road leading to it were both constructed in 1957 by DOT staff. A 1.5-inch surface of BST and a six-inch clay base were used. They have since been resurfaced and have curb and gutter. The work was probably done in 1979 when the office and maintenance areas were built. The pavement is in fair shape, but it is showing signs of ravelling and needs resurfacing. The 44 parking spaces badly need striping.

The gravel road to the boat ramp has several pot holes in need

of additional gravel, and the road needs scraping. Road shoulders and ditch lines are in fairly good shape. There is currently \$2,000 allotted to the N.C. DOT to maintain the unpaved roads in the park by adding gravel and scraping the roads three times.

RECOMMENDATIONS FOR ROADS AND PARKING AREAS

The existing annual service agreement with the N.C. Department of Transportation is adequate for maintenance of the park roads. It is highly recommended that the road to the boat ramp be paved due to the traffic load and the concomitant maintenance needs. This can be done in the next few years under the agreement with DOT at an estimated cost of \$20,000.

The parking lot should be resurfaced within the next two years. The estimated cost is \$6,000. This should be done at the same time the boat ramp road is paved.

The existing campground road should not be paved, due to the light traffic flow and the plans to construct a new and larger family camping area in another location. Construction of a parking lot at the West End Access is underway. Paving of this lot will be considered in the future.

EXISTING CONDITIONS - SEWER SYSTEMS

There are currently only four active sewer systems at Pettigrew State Park. They range in size from 500 gallons to 3,800 gallons. All systems have conventional septic tanks with distribution boxes and drainfield lines. A full evaluation of the sewer systems has not taken place. The following evaluations are based on information currently available.

The office and maintenance sewer system has a 2500-gallon septic tank, located in the lawn area in front of the office, with six 65-foot nitrification lines. There is no riser on this septic tank. The drain lines appear to be in satisfactory working order. The septic tank has not been pumped out since its construction in 1978.

The camping area washhouse sewer system has a 3,800-gallon septic tank with ten 150-foot nitrification lines. The tank contains two concrete risers. Eighty percent of the drainfield is cleared of trees. The septic tank has been pumped out at least once, and the system appears to be working properly. It was constructed in 1969.

The system serving the superintendent's residence at Somerset Plantation has a 1,000-gallon septic tank with three 100-foot nitrification lines. The drainfield lines are working. The septic tank does not have inspection risers. This system was replaced in 1988.

The Furlough House system is currently being used by the superintendent's new mobile home. The Furlough House has been unoccupied for years and is used for storage only. A temporary employee barracks (formerly an office trailer for First Colony Farms) has also been removed from the sewer system. The size and condition of the system is unknown, but it appears to be a 700-gallon septic tank with three 60-foot nitrification lines. The Department of Health will not approve a new sewer system in this location due to the high water table, but they will allow repair to the existing system, since the system was installed before new sewer regulations were enforced. Although of unknown age, the system seems to be functioning adequately at the present time.

The group camp pit privy is located about 400 feet from the Furlough House. It appears to be working properly.

RECOMMENDATIONS FOR THE SEWER SYSTEMS

The office and maintenance area system has never been pumped out. The tanks need to be located and pumped out, and manhole risers need to be installed.

The campground sewer system needs to be inspected for sludge level in the tank. The estimated cost is \$500 if the tank has to be pumped.

The superintendent's residence system is fine.

The Furlough House system will probably fail within the next two to three years. At the present time, however, the existing septic tanks need pumping out. The estimated cost is \$150.

EXISTING CONDITIONS - WATER SYSTEM

The park is currently supplied by one six-inch well located behind the superintendent's former residence. The well is enclosed in a well house that matches the Somerset historic building. The well supplies water to the superintendent's residence, camping area, picnic area, and office area. The Somerset Plantation also gets its water from this well. The N.C. Department of Cultural Resources pays the electric bill at the well in exchange for the water supply.

The capacity of the well and the size of the pump is unknown, but the system itself was constructed in 1968. A 1,000-gallon water storage tank with related valving connects into a four-inch AC pipe located outside of the well house. The well house piping is two-inch galvanized. The well water is not chlorinated. The maintenance staff has not experienced many problems with the current system, although it is almost 25 years old.

The water distribution system is four-inch asbestos cement pipe that is approximately 2,000 feet in length. The service feeding

off the 4-inch A.C. pipe is galvanized steel, ranging in size from 3/4 inch to two inches. The steel pipe is beginning to give taste and odor problems.

At the Furlough House is a 6-inch well of unknown depth and age. A jet pump supplies the water to the superintendent's trailer and to a hose bib at the group camp. The well has a high iron content and has a small residential iron filter with an automatic backwash system on it.

The group camp has a two-inch shallow well with a hand pump on it. The well is approximately 15 feet deep and was constructed by park staff.

RECOMMENDATIONS FOR THE WATER SYSTEM

A new distribution system should be constructed. Although the system is functioning at the present time, the system is old enough to be worn out. Pettigrew is one of the two parks that still have asbestos cement pipe in use today. The galvanized steel piping also needs replacing. The pressure tank inside the building, as well as the pump and controls, also needs replacing. A chlorination system also needs to be installed. The estimated construction cost is \$40,000.

A new well will need to be drilled at the Furlough House if the superintendent's residence is constructed in this area and the campground is developed. The estimated cost is \$10,000.

EXISTING CONDITIONS - ELECTRICAL SYSTEM

The park receives electrical power from North Carolina Power and Light Company (NCP&L). The underground distribution lines are owned and maintained by the power company. Park facilities are served by an underground power line from three different overhead power transformers that run along SR 1168.

The maintenance office area is served from a power pole located beside the fuel pump area near a 30-foot canal. Service runs underground to the office and maintenance building approximately 50 feet away. This system was installed in 1978. Underground service goes from the shop to the gas pump, information building, and pierlight.

The campground washhouse area is served from a pole located along SR 1168, approximately 350 feet away from the washhouse. The line runs underground from the pole and was installed in 1969.

The Somerset Residence is supplied power from a pole located across from SR 1168 in front of the superintendent's residence. The line runs underground from this location to a meterbase at the back corner of the residence. A separate underground service line leaves the same pole across from SR 1168 and runs to a

central meterbase at the Somerset Residence. A feeder line leaves the meter base and feeds the pump house approximately 200 feet away.

The Furlough House is served by an overhead pole located beside SR 1123 across from the house. It then goes underground and feeds the new mobile home of the park superintendent and the temporary barracks.

RECOMMENDATIONS FOR THE ELECTRICAL SYSTEM

Due to the location of the existing park facilities in relation to the overhead main power line along SR 1168, it is not recommended that power be supplied by one distribution system. The present system is adequate for the current operation. North Carolina Power & Light will maintain and replace the present distribution system at no charge to the park. Any development on the south side of Lake Phelps will be supplied by Tideland Electric Membership Corporation.

EXISTING CONDITIONS - TELEPHONE SYSTEM

Four business phones are currently located at the office, and a public telephone is located in a telephone booth at the park office. The superintendent's residence and the Furlough mobile home site also have phone service.

All lines are maintained and replaced by Carolina Telephone Company of Williamston, North Carolina.

RECOMMENDATIONS FOR THE TELEPHONE SYSTEM

The existing system is adequate.

EXISTING CONDITIONS - PARK CONTROL GATES AND CANALS

There are six control gates and canals located within the north shore of Pettigrew State Park: Moccasin, Western, Thirty Foot, Transportation or Somerset, Magnolia, and Bee Tree. Considering the age of the concrete structures, most of them built before 1937, the concrete is in fairly good shape.

A brief inspection, the findings of which follow, was done at each canal with the exception of Transportation Canal. No detailed evaluation inspection was conducted on the piping, gate operation, or concrete soundness.

Moccasin Canal - The control structure was replaced in 1985 under a reimbursement with the N.C. DOT bridge crew from Creswell. An earlier replacement failed and was washed out in 1983. A wooden bulkhead was used in lieu of a concrete retaining wall due to

costs. The control gate is in good shape, and the canal to the structure is in fair shape. Water is leaking around the control gates, as it is with all the gates. This has not caused much of a problem to date, however. The canal downstream is in fair to poor shape. The invert outside of the gate needs additional rip rap.

Western Canal - The front of the control gate is silted in, but the control gate is operable. Both the front of the canal and downstream need cleaning out. Both silt and vegetation prevent adequate flow.

Thirty Foot Canal - The control gate is in good condition, and silt has been removed from the front of the gate. Silt and vegetation are not as bad as they were in 1983.

Transportation Canal - The control gates are in good condition. The canal to the lake is in the best shape of all the canals. Silt and vegetation is bad downstream.

Magnolia Canal - This canal is completely inoperable. Control gates work but leak badly. The canal has silted up, both upstream to the lake and downstream. It needs to be eliminated by back filling with clay.

Beetree Canal - The control gates are in good condition. There is a heavy tree and a silt problem downstream. Downstream on park land, a culvert pipe going under the road to a nearby field has to be sealed when water is released or the adjoining field floods.

RECOMMENDATIONS FOR PARK CONTROL GATES AND CANALS

Since 1985, the year of the big fire, the water level has been too low to require management. Although all the control gates are working and are routinely maintained by park staff, the condition of the downstream canals makes a management plan impossible. It appears that the volume of water that flows out of Pettigrew has greatly decreased due to drought and springs drying up.

At the present time, routine flushing of the canals that do work and routine lubrication of the control gates is recommended until a management plan on the lake water level is implemented. A rough estimate on dredging the downstream canal is approximately \$100,000 a mile to clean an average canal two-feet deep, with vegetation and silt removed. A hydrology study needs to be done by the Soil Conservation Service to study the importance of the canals and the feasibility of managing them.

SUMMARY OF ROAD AND UTILITY INVENTORY

With the exception of the water system, the park utilities are in

fair-to-good shape. Routine maintenance will keep the sewer system lasting for many more years. The road system is in fair shape due to the low volume of traffic the roads receive. Boat ramp roads will probably be paved next year. The canal gates are in sound shape now, but the canals themselves are in need of a lot of silt and tree removal.

MAJOR CAPITAL IMPROVEMENT PROJECT PRIORITIES

The Pettigrew State Park Master Plan describes the long-range vision of what the park should be. A significant portion of the master plan is devoted to identifying development plans for the park. The development plans are to be implemented by identifying and detailing specific capital improvement projects that can be constructed through the state construction process. By identifying, evaluating and ranking each development project, the Division has created a priority list of capital improvement projects for each park and for the state parks system. The Pettigrew State Park project ranking is based upon objectives such as promoting public health, protecting natural resources, enhancing environmental education, increasing public accessibility, and improving the park's appearance.

As a part of the general management plan process, the master plan with its proposed development was carefully reviewed to determine if changes were needed. Such a review had not been undertaken since the master plan was published in 1977. Changes in development plans were deemed necessary. The original development project list, shown below, was based upon development proposed in the park's master plan. This original project priority list represented a logical and reasonable phase of development. It did not represent a total listing of all proposed master plan development. Recommended changes to that list and the revised project list follow.

In reviewing master plan capital improvement recommendations, the general management plan evaluation team considered factors such as changes in environmental regulations, condition of facilities, development in the area, natural heritage inventory, changes in recreation demand, park visitor safety considerations, State Parks Act stipulations, and current recreation demand. This review of proposed capital improvements resulted in changes, additions, and deletions to capital improvement proposals. Specifically, development at Big Point is impossible because of natural and archaeological resources discovered in this area. Soil conditions dictate where development can occur at the Pettigrew access area in order to accommodate subsurface sewage demands.

PRE-GMP PROJECT PRIORITY LIST

Rank	Description	Mean-Score	Total Costs
1.	Visitor center complex	464	\$ 750,000
2.	Ranger residence (1)	428	128,300
3.	Concession stand and pier	405	123,984
4.	Tent & trailer - 70 sites	382	902,000
5.	Warehouse building	336	130,000
			=====
TOTAL:			\$2,034,284

RECOMMENDED CHANGES TO PROJECT PRIORITY LIST

Projects with Revised Cost Estimates and Unchanged Scopes

1. Additional space is added to the visitor center project floor plan for dugout canoe display (\$1,045,500).
2. Ranger residence project is land dependent (\$118,300).

Projects to be Deleted

1. Concession stand and pier project (\$123,984) deleted. Project deemed not feasible because of environmental constraints and amount of user traffic.

Projects with Changed Scopes

1. Family tent and trailer campground, ranger residence, and picnic area renovations project (\$863,300) decreased from 70 campsites to 40 while adding picnic area renovations, an amphitheater, a ranger residence, and a Clevis Multrum toilet to the group camp. The T&T campground portion of this project is land dependent.
2. Maintenance area improvements project (\$280,100) expanded to include a flammable storage building and a vehicular storage building to the old warehouse project.

Projects Proposed to be Added to List

1. Trail development project (\$22,200) to build all the trails discussed in the GMP review.
2. Building renovations project (\$24,700) to demolish two building and make all needed FIIP repairs on record.
3. Personnel barracks project (\$234,000), a six-man version of the standard building. The barracks project is land dependent.

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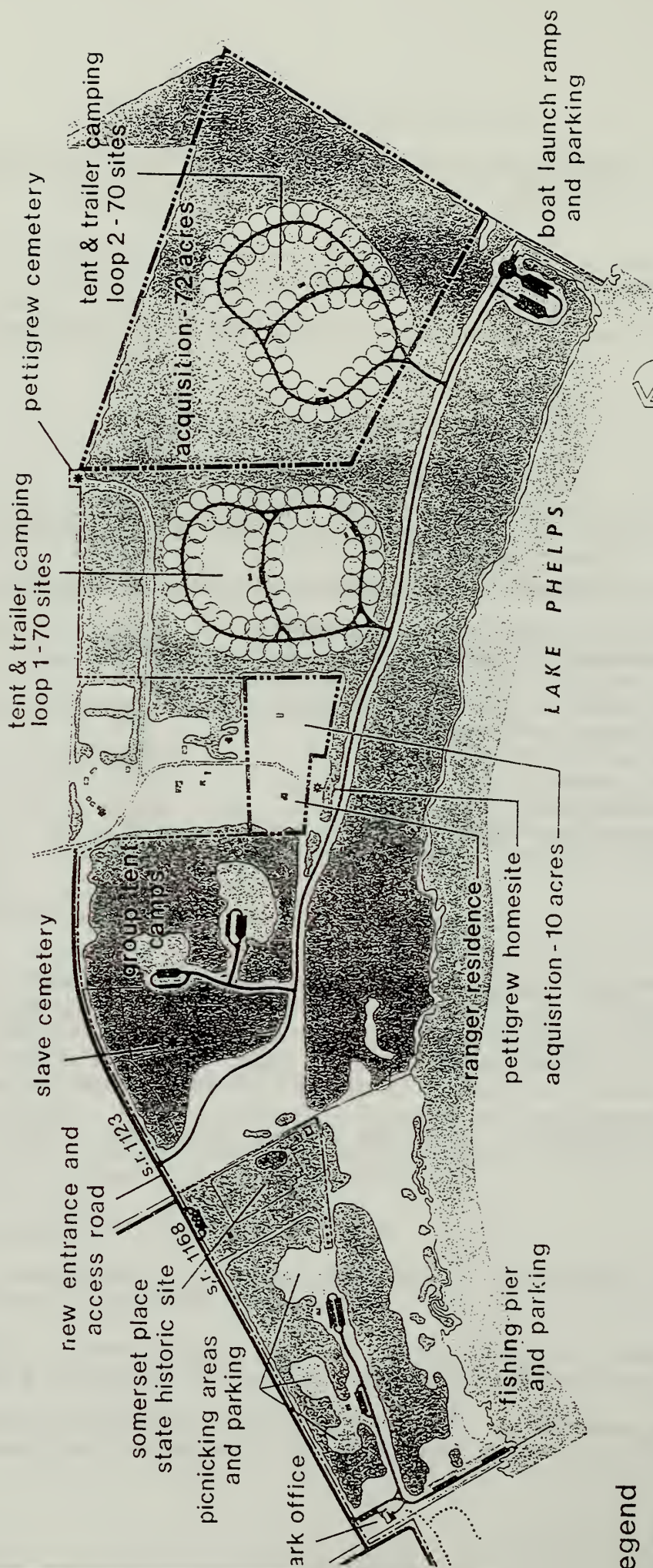
4. Westend access project (\$59,100) provides parking, lake access, restrooms, and trail head opportunities at a remote site.
5. Water system repairs project (\$60,600) to make all water system repairs per the inventory review.

For more detailed explanation of these projects, see Appendix B.

REVISED PROJECT PRIORITY LIST

Rank	Description	*Mean Score	Total Costs
1.	1 ranger residence (land dependent)	545	\$ 118,300
2.	Water system repairs	522	60,600
3.	Visitor center complex (land dependent)	516	1,045,500
4.	40 tent/trailer sites, residence, picnic area renovations	493	863,300
5.	Westend access development	484	59,100
6.	Building renovations	459	24,700
7.	Trails development	439	22,200
8.	Maintenance area improvements	423	280,100
9.	Personnel barracks (land dependent)	413	234,000
TOTAL:			=====
			\$2,707,800

* The mean score comes from the Division's Project Evaluation Program (PEP). The PEP uses an evaluation formula to rank projects that considers three factors: the objective of the project; the justification or urgency for funding; and the estimated annual number of persons (visitors and/or employees) who are affected by the project. Projects are evaluated by the park superintendent, district superintendent, and Division management.



legend



vegetation



recreation use area



proposed acquisition boundary

master plan - pettigrew access area

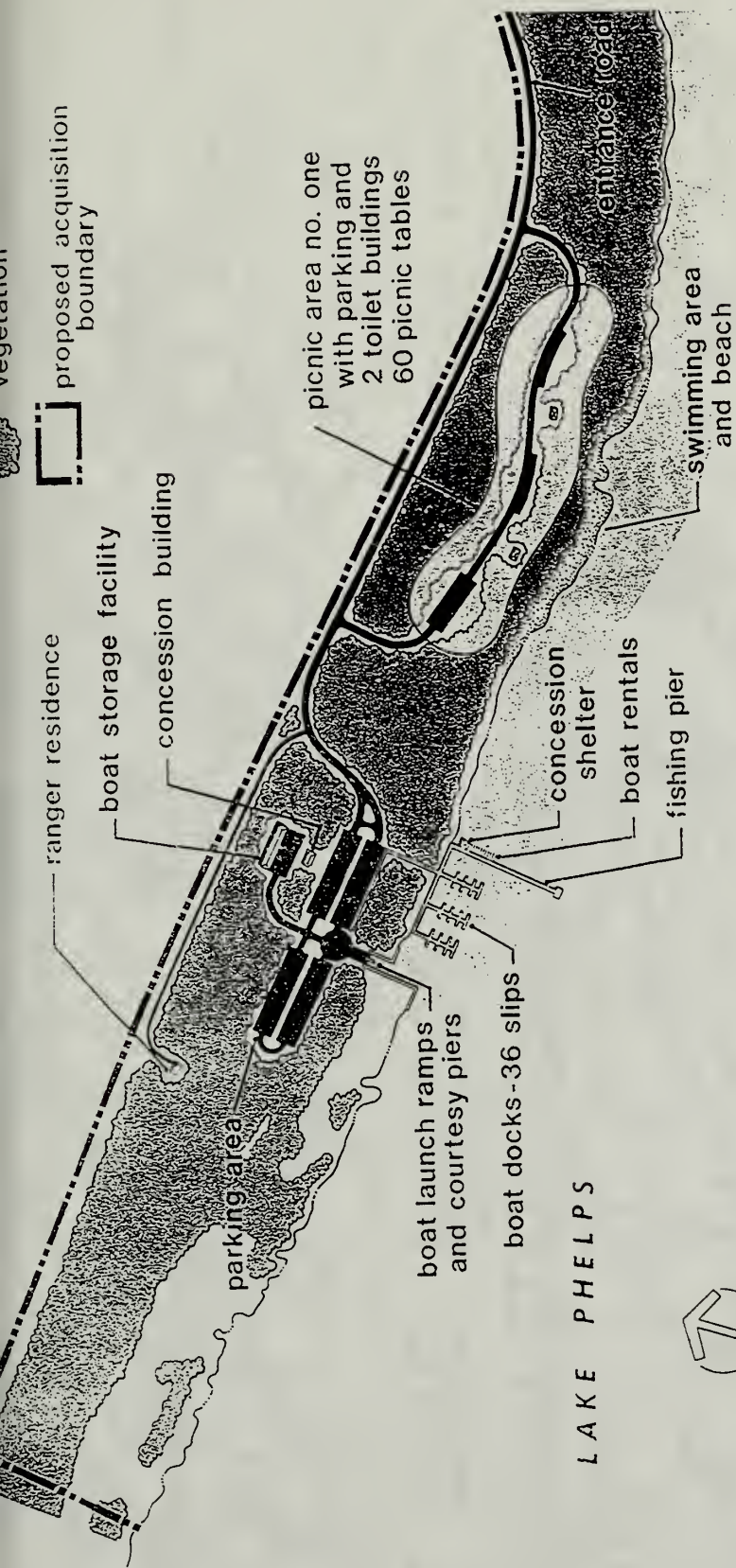
PETTIGREW LAKE PHELPS STUDY

washington & tyrrell cos.

Nov., 1977

north carolina

Figure VII-2



master plan - big point access area
PETTIGREW-LAKE PHELPS STUDY
north carolina
Nov., 1977
Washington & Tyrrell cos.

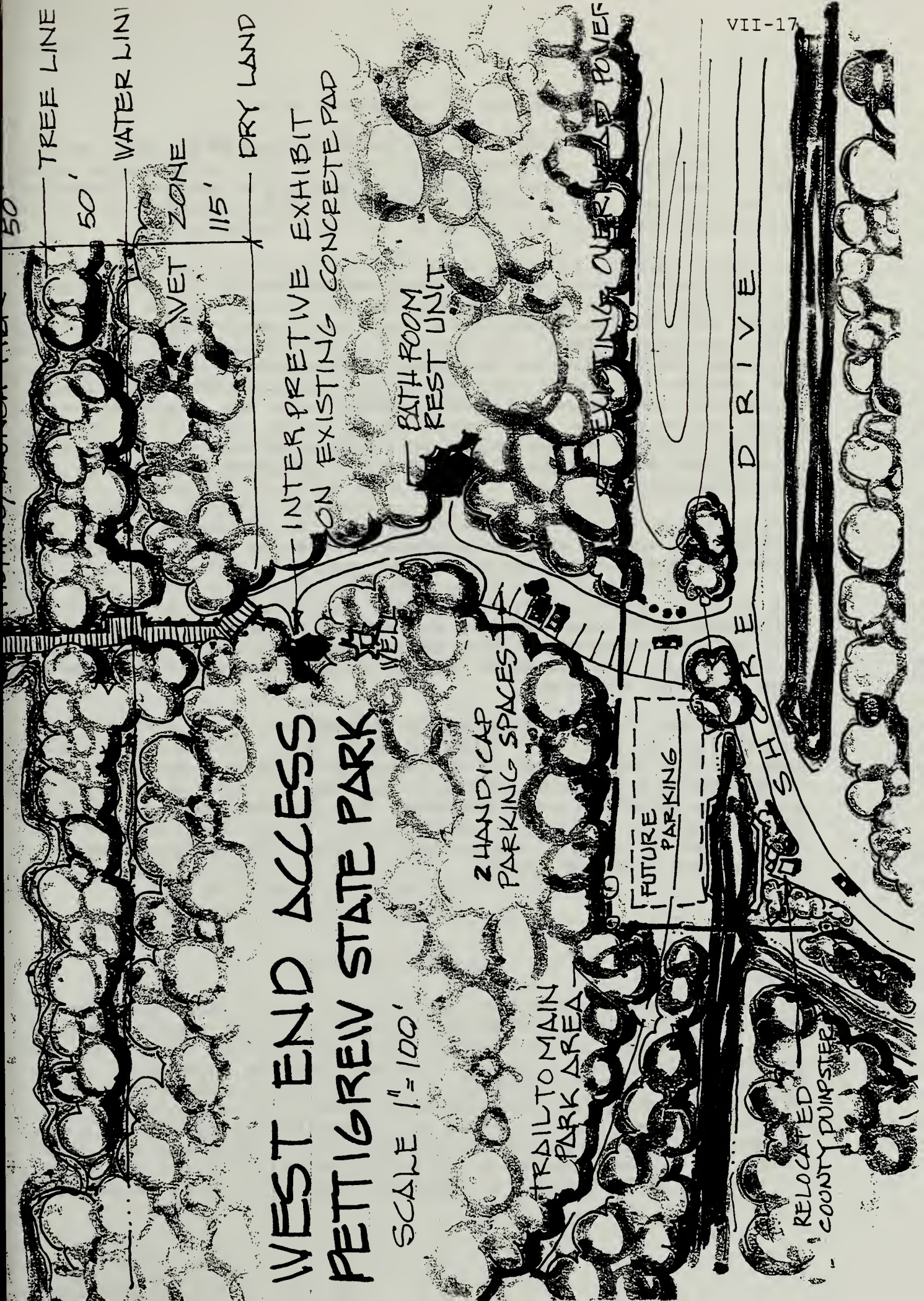
Figure VII-3

PETTIGREW DESIGN CONCEPT



- L A K E P H E L P S -

MASTER PLAN - UP DATE 10-5-00



WEST END ACCESS PETTIGREW STATE PARK

SCALE 1" = 100'

TRAIL TO MAIN
PARK AREA

2 HANDICAP
PARKING SPACES

FUTURE
PARKING

RELOCATED
COUNTY PUMPSTATION

BATH ROOM
REST UNIT

INTERPRETIVE EXHIBIT
ON EXISTING CONCRETE PAD

BRIDGE OVERHEAD POWER

SHORE
DRIVE

TREE LINE

WATER LINE

WET ZONE

DRY LAND

CHANGES TO THE MASTER PLAN

As a result of the GMP review of the Pettigrew State Park Master Plan, changes in development proposed in the master plan were made. Additional land acquisition needs for natural resource protection and for recreational facility development were also identified that were not noted in the 1979 master plan.

One major change is elimination of the proposed development of the Big Point Access Area. The Big Point area is too environmentally fragile an area to accommodate the type and scope of development that had been proposed. Sand that would have been needed for a swimming beach, for example, would have filled wetlands. Archaeological resources have been discovered at Big Point since 1977. Also, the level of visitation would not have supported a concession building. It was decided that the Big Point area would better serve park purposes by being left in a natural state. Another change calls for the acquisition of $\pm$ 90 acres north of SR 1168 to provide land for a campground, barracks, and a visitors center.

There is not currently a swimming area at Pettigrew. The 1977 master plan called for development at the Big Point access area that included a swimming beach/area.

The existing park property along the Pettigrew site is unsuitable for swimming because of the vegetation and silted lake bottom. The 500-acre tract on the southern end of the lake has a good sandy bottom, but the lake is very shallow there and not considered good for swimming.

The Division views swimming as a desirable park activity and would like to develop a swimming beach area, provided a suitable location is identified. The Pettigrew State Park Advisory Committee has recommended that a study be done for a future public swimming area in the park. The Division will investigate and attempt to identify a suitable area for public swimming. If identified, a capital improvement project will be developed as a part of the next GMP update.

VIII. VISITOR SERVICES AND OPERATIONS

CURRENT VISITOR SERVICES

The focus of Pettigrew State Park is the 16,600-acre Phelps Lake. The lake offers outstanding fishing and ideal conditions for sailing in shallow draft boats. A variety of other boats use the lake as well. The park provides two boat ramps with piers for public access to the lake and the docking of boats.

Pettigrew State Park also offers 13 campsites, each with a picnic table and grill. Water and restrooms with showers are nearby. A separate primitive camping area -- with tent pads, grill, pit privy, picnic tables, and water -- is also available.

Nestled in a large cypress grove is the picnic area. Tables and grills are provided. A grassy field near the picnic grounds serves as a play area, and one picnic shelter is also provided.

Various interpretation and education programs are offered by park staff. The park's office/maintenance building and parking area are located in close proximity to the park's facilities.

OPERATIONS EVALUATION

Aside from the shortfalls of the operating budget, which are highlighted at the end of this chapter, four other operational issues were identified through the GMP process. They are:

1. staffing shortfalls
2. mooring buoys in the lake
3. canal maintenance for lake level control
4. safety training for personnel

STAFFING SHORTFALLS

The existing staff of two commissioned personnel is insufficient to cover the normal operating hours of the park. Pettigrew State Park has the fewest staff of any park in the system, yet 24-hour boat access is allowed at Lake Phelps. Typically, the office is not manned on weekends or holidays, and, therefore, park visitors have no initial contact with staff upon entering the park. Waterside patrol is nearly nonexistent, and there is only one maintenance worker at the park. The existing staff have little time to coordinate volunteer efforts that would greatly assist the park. Recommended staff additions are shown in Table VIII-1.

Table VIII-1. Existing and Proposed Staff

<u>Existing</u>	<u>Proposed</u>
1 Superintendent	1 Park Ranger I
1 Ranger II	1 Six-month General
1 Maintenance Mechanic	Utility Worker
1 Seasonal Park Attendant	
1 Full-time Clerk-Typist	

MOORING BUOYS

At present, there are no mooring buoys around the lake. At other more developed state lakes, these buoys have proliferated, creating an unattractive sight as well as hazards to navigation and high-density boating. There are no piers on Lake Phelps at this time. A decision concerning their prohibition or allowance should be made.

The Pettigrew State Park Advisory Committee recommended that submerged mooring buoys be allowed on Lake Phelps at the rate of one per lakefront property owner. The committee further recommended that each buoy be located within the confines proper of each property and located only as far out into the lake as the legal pier distance. The committee recommends that such moorings be approved/permitted by the park superintendent, and that the mooring locations be identifiable at all times.

State lakes regulations govern Lake Phelps and the other state lakes, including the permitting of piers and mooring buoys. The recommendation of the Pettigrew State Park Advisory Committee will be forwarded to the Division team that is studying the state park system administrative procedures, where it will be considered. Before current operating procedures concerning mooring buoys at Lake Phelps can be changed, the current administrative procedures will need to be changed. During 1994, the Division will also develop a general management plan for the state lakes. State lake regulations should be reviewed and revised with all the lakes in mind.

CANAL MANAGEMENT

Park staff should continue to exercise the gates and keep them in good working order to ensure lake level control. Efforts should be made to get downstream canals cleared of debris to prevent water from backing up into canals maintained by the park. Both the operating needs and the capital needs of these canals must be addressed.

SAFETY TRAINING

Because of the wide expanse of the lake and lake shore, special provisions should be made to ensure that park staff are fully capable in the areas of emergency rescue and evacuation. Park staff should receive training in both landside and waterside search and rescue procedures. Because of the long response time at the park, measures have already been taken to ensure that at least one staff member is certified and maintained at the emergency medical technician level. The National Safety Council's Defensive Driving Course should be instituted as a prerequisite for the operation of state motor vehicles. Training for small craft boat operations is also needed.

OPERATING AND EQUIPMENT BUDGET

Since Pettigrew State Park has the smallest staff of any independent park in the Division, it is critical that temporary wages be funded for the park's two peak-load positions. Both peak-load positions have never been fully funded.

Pettigrew has experienced record attendance each year for the past four years (1989-92), and the demand for services has therefore increased. With the opening of the West End Access, visitation should be even higher, and more park facilities will need staff attention.

Pettigrew has the largest land and water acreage and the smallest staff in the state. Not only is its total budget next to last and lowest of any independent unit, but its nonpersonnel budget is next to last among North Carolina state parks.

Line Item Budget Needs

Line Item 1411 - To fund Pettigrew's two peak-load positions, a clerk-typist and park attendant, \$7,713 is needed.

Line Item 1491 - Since most of the park's visitation occurs in the spring, a six-month general utility worker is desperately needed in addition to the present park attendant. The need will increase with the opening of future areas. \$7,213 will fund the position.

Line Item 2110 - An increase in cleaning supplies will be needed with the projected opening of a new area. (\$1,200)

Line Item 2310 - Program attendance has more than doubled over the past four years, as has the need for materials and props. (\$1,500)

Line Item 2360 - The need for emergency medical services equipment has increased with attendance. (\$750)

Line Item 2400 - Tools need replacing and, as facilities expand,

new tools are needed. Since there is only one maintenance employee, \$4,000 will suffice.

Line Item 2530 - All park vehicles are over six year old, increasing the need for parts. The tractor is over 15 years old and in constant need of repairs. (\$1,400)

Line Item 2541 - Pettigrew is now giving canoe programs and will need support funds. The canoes currently being used are surplus from Merchant's Millpond State Park. Canoes may need replacing in a few years, depending on the amount of use.

The rest of the line items show modest increases for inflation. If the number of personnel is increased, support funds will be needed.

Line Item 5100 - The park needs a laminating machine for exhibits and interpretive programs.

Line Item 5200 - The park office needs a computer and accessories.

Line Item 5300 - A T.V., VCR and camera are needed for interpretive programs.

Line Item 5400 - The tractor needs replacing, not only because of its age but also because it is too small for many park jobs.

Line Item 5500 - The riding mower and a pull-type mower need replacing.

Table VIII-2. Operating Budget Needs (Excluding Permanent Staff Salaries)

<u>Line</u> <u>Item</u>	<u>Description</u>	<u>Need</u>
1411	Peak Load Wages	\$ 7,713
1491	Seasonal Wages	7,213
2110	Janitorial Supplies	1,200
2130	Clothing and Uniforms	1,150
2190	Household Cleaning Supplies	200
2310	Educational and Scientific Supplies	1,500
2360	Medical and Agricultural Supplies	750
2400	Construction and Repair Supplies	4,000
2510	Motor Fuels and Lubricants	1,000
2520	Tires and Tubes	200
2530	Parts for Motor Vehicles	1,400
2541	Boat Operations	500
2542	Boat Maintenance	100
2590	Other Motor Vehicle Operations	500
2600	Office Materials and Supplies	600
2920	Photographic Supplies	100
2990	Other Supplies	500
3111	Travel (Administration Car)	3,600
3112	Travel Subsistence	500
3210	Telephone	1,400
3250	Postage	600
3310	Electricity	2,500
3410	Printing and Binding	1,300
3510	Repairs to Buildings	750
3590	Other Maintenance and Repairs	1,500
3990	Other Services	700
4400	Service and Maintenance Contracts	200
5100	Office Furniture and Equipment	700
5200	Date Processing Equipment	5,500
5300	Education, Medical, Agric. Supplies	1,400
5400	Motor Vehicles	25,000
5500	Other Equipment	<u>8,000</u>
TOTAL:		\$81,676

IX. LAND ACQUISITION NEEDS

LAND ACQUISITION STATUS

As of August, 1992, Pettigrew State Park contained approximately 1,143 acres of land. Lake Phelps is also managed by park staff and contains 16,600 acres. The land area of Pettigrew State Park is estimated because a tract acquired by donation was not surveyed at the time of acquisition. The acreage of the park will be revised once this property is surveyed. Pettigrew State Park was included in the 1985 appropriation for land acquisition and approximately 374 acres were acquired through this funding source.

A Memorandum Of Understanding has been completed that transferred management of approximately 35 acres to the N.C. Division of Cultural Resources. The 35 acres include the Somerset Place Historic Site.

FUTURE LAND ACQUISITION NEEDS

Land that was identified in the 1977 park master plan has been acquired. Based on the natural resources of the park along with recreational program needs, additional land acquisition needs were identified in the general management plan review.

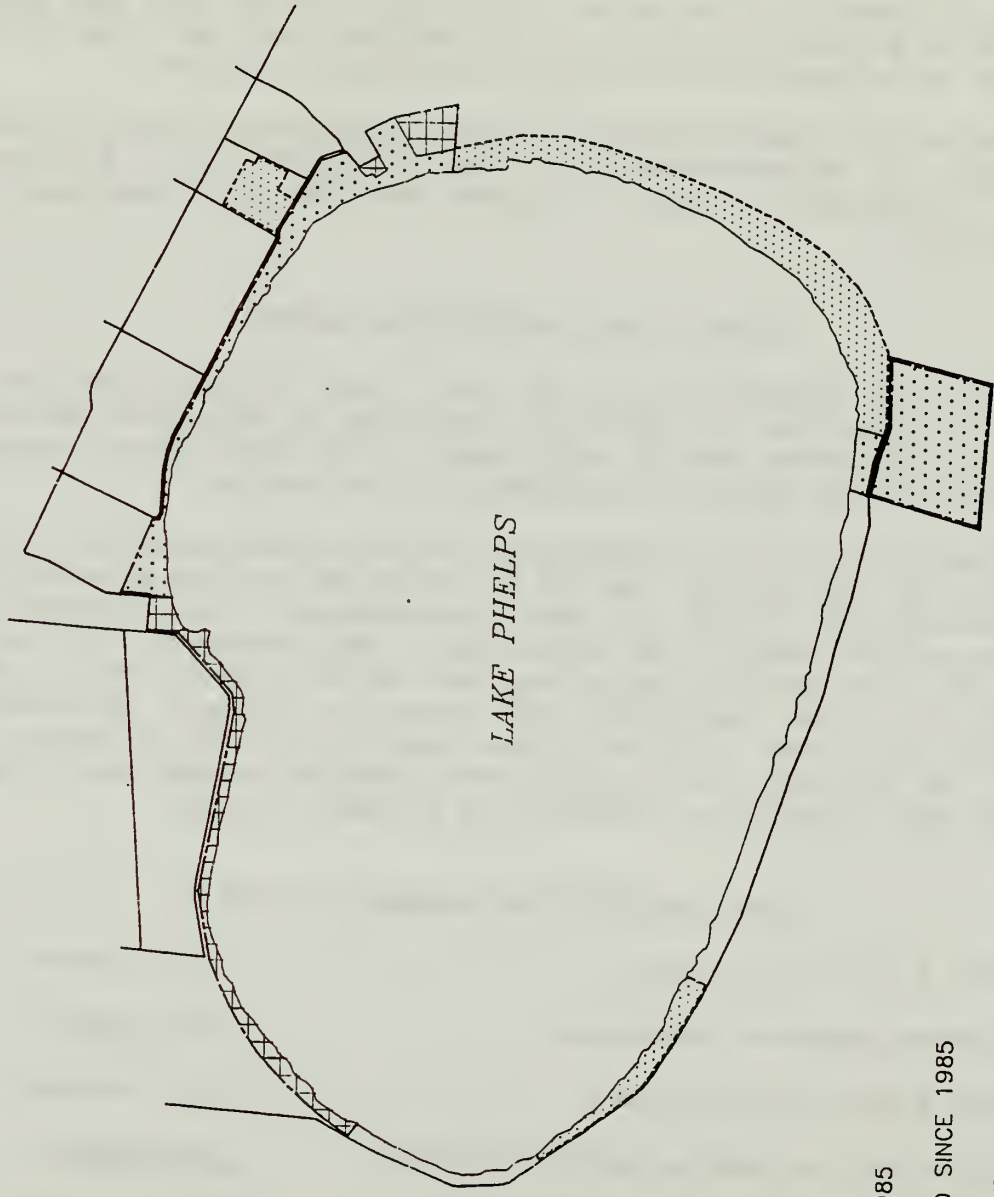
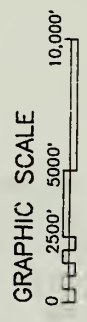
The acquisition of the remaining privately held property along the shoreline of Lake Phelps should be included in the planned needs. An estimated 500 acres of land encompasses the privately held property on the Lake Phelps shoreline. Approximately 400 acres of this is on the eastern shoreline and would protect water quality and habitat. The remaining 100 acres is already developed and impacting the lake. In addition, approximately 90 acres for a visitor center and family tent and trailer campground near the existing park should be included in planned needs.

LAND ACQUISITION SUMMARY TABLE

1985 size of the park	769 acres*
Current program additions	<u>374 acres</u>
1992 size of the park	1,143 acres*
Additions to master-planned needs	<u>590 acres</u>
New total planned park size of park	1,733 acres*

* Land only.

PETTIGREW
STATE PARK
LAND ACQUISITIONS



LAKE PHELPS

LEGEND

-  PARK - 1985
-  ACQUIRED SINCE 1985
-  FUTURE NEEDS

APPENDIX A

PARK PROFILE

PETTIGREW
PARK PROFILE

Location: Washington and Tyrell counties

Size: 17,743 acres (16,600 acres is Phelps Lake)

Reason for Establishment: Phelps Lake is the second largest natural freshwater lake in North Carolina and an angler's paradise. The adjacent Somerset Place, now a state historic site, gives historical interest to the park and its outstanding natural resources. Its origin as a park stems from federal public works programs of the Depression era and local county governments urging establishment of a state park.

Facilities:

- Boat ramp
- Picnic area with tables, grills, 1 shelter
- Primitive group camp
- Hiking trails with overlooks
- 13-site tent and trailer campground with washhouse
- Park office
- West End Access

Existing Staff:

- 1 Superintendent
- 1 Ranger II
- 1 Maintenance Mechanic
- 1 Seasonal Park Attendant
- 1 Clerk Typist

Statistics:

	<u>FY 1990-91</u>
Visitation (Calendar 1991)	79,399
Operating Budget	\$101,359
Revenue	\$ 11,628

APPENDIX B

CAPITAL IMPROVEMENT REQUESTS

North Carolina's Division of Parks and Recreation

NOV 10, 92

Page 1

Projects By Park In Priority Order

Description	Job Codes	Dst Cde	Locations	Mean Score	Total Costs
ranger residence (1)	300N 8 2	EAS	Pettigrew	545	\$ 118,300
n system repairs	610R 8 1	EAS	Pettigrew	522	\$ 60,600
visitor center complex	132N 8 3	EAS	Pettigrew	516	\$ 1,045,500
40 t&t sites/residence/picnic area renovations	230N 8 1	EAS	Pettigrew	493	\$ 863,300
and access development	200N 8 1	EAS	Pettigrew	484	\$ 59,100
ding renovations	530R 8 1	EAS	Pettigrew	459	\$ 24,700
ls development	40N 8 1	EAS	Pettigrew	439	\$ 22,200
tenance area improvements	148N 8 1	EAS	Pettigrew	423	\$ 280,100
personnel barracks	100N 8 1	EAS	Pettigrew	413	\$ 234,000

					\$ 2,707,800

					\$ 2,707,800

number of jobs reported = 9



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